INPUT

RESEARCH REPORT

Impact of NOs on Selection of Internet/Intranet Platforms, U.S.

Impact of NCs on Selection of Internet/Intranet Platforms, U.S.

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Abstract

Since their inception, network computers (NCs) have been lauded by many proponents as replacements for PCs. INPUT's view has always been that NCs will replace PCs only in situations where PCs have been deployed inappropriately due to lack of a viable alternative.

Instead, NCs will be used largely to replace existing mainframe/mini/X terminals, and also to convert some existing PC users operating in a localized environment to a network-centric environment.

Despite the attention given to NCs, their take-up to date has been low. INPUT believes that the market will accelerate as NCs become increasingly capable of front-ending server-based Windows applications, as Microsoft's Windows Terminal Server provides the infrastructure for redeploying existing applications in a thin client model, and as Java stabilizes and Java applications increase in availability and quality.

The NC market will be represented mostly by Windows terminals, or general-purpose NCs capable of running Windows as well as legacy terminal-based applications. The dedicated Java NC will not offer sufficient benefits to prompt a change in users' Windows-based environments.

This report examines users' use of and attitudes to NCs, including related server, database, network and object platforms, support costs, and comparisons between PCs and NCs.

**Internet/Intranet Technologies &
Solutions Program**

**Impact of NCs on Selection of
Internet/Intranet Platforms, U.S.**

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I

Introduction

A

Objectives and Scope

The network computer (NC) concept has failed to attract large numbers of users away from PCs, as many of its proponents have argued over the past two years that it would. However, INPUT has always viewed the classic NC as a replacement for terminals and an appropriate device for users with low computing needs.

The NC market is highly dynamic—the nature of NCs is changing, from the Java-centric terminals proposed in 1996 to terminals designed to access server-based Windows and legacy applications.

This report examines users' use of and attitudes to NCs, including related server, database, network and object platforms, support costs, and comparisons between PCs and NCs.

B
Research Methodology

INPUT interviewed 50 large US companies during November 1997. Exhibit I-1 shows the industry sector breakdown. The questionnaire used for this survey appears at the end of this report (Appendix A).

Exhibit I-1

Sample Breakdown by Industry
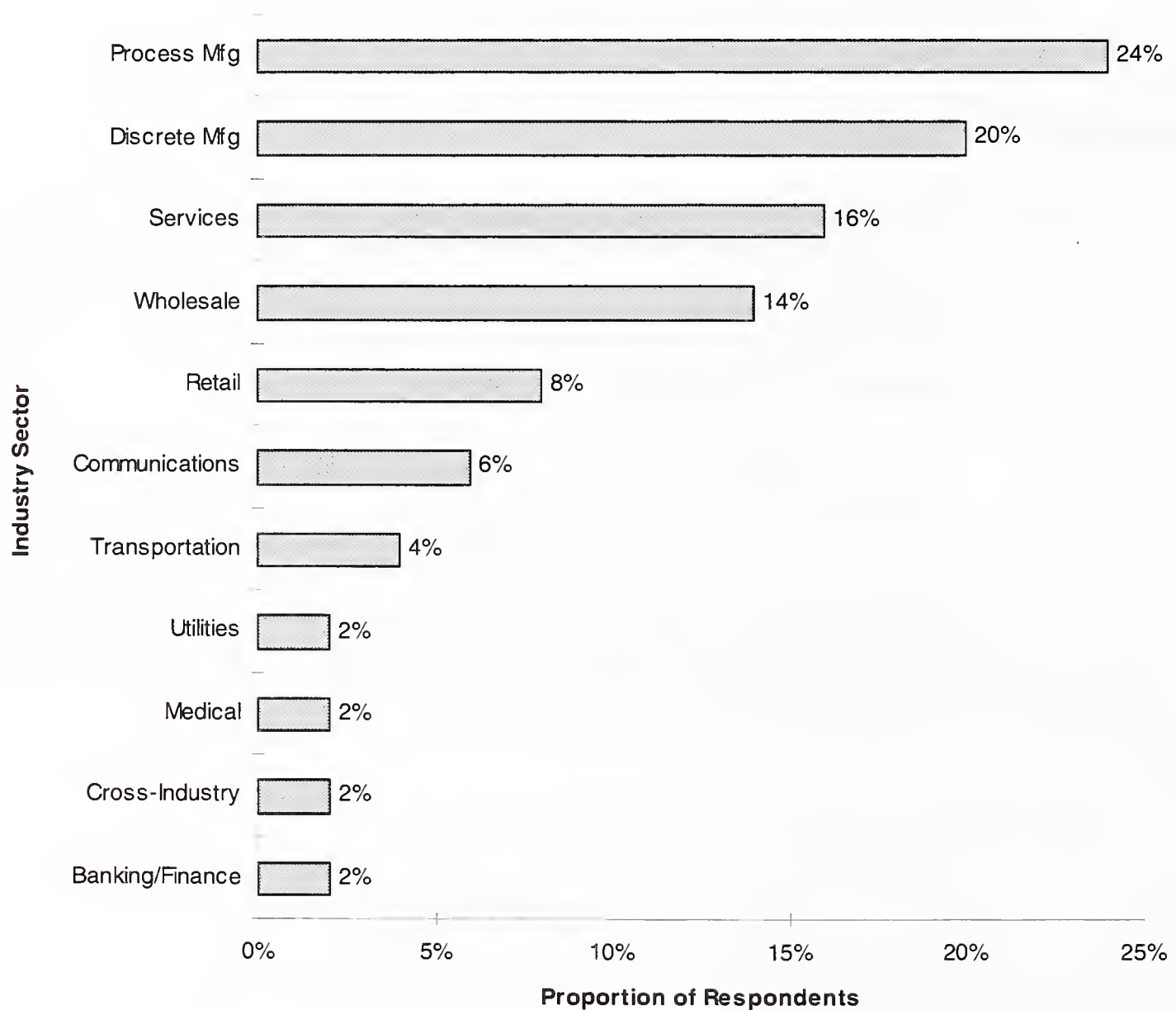
Sample: 50   Source: INPUT

C
Report Structure

- Chapter II—Executive Summary—presents a summary of the key findings of this report, plus market forecasts

- Chapter III—Current Platform and NC Usage—shows patterns of NC and other platform and network use

- Chapter IV—Suitability of NCs and Related Platforms for Enterprise Computing—shows suitability of: server, database and network platforms for NC use, NCs for individual applications and functions, NCs by architecture type, Java, and importance/satisfaction of client platform characteristics

- Chapter V—Future NC and Related Platform Usage and Requirements—presents anticipated future take-up of NCs, future object use and NC scenarios, and future requirements of server platforms

- Chapter VI—Budgets and Costs—shows a breakdown of IT budgets and expected affect of NC deployment on all IT support costs

D
Related Reports

- *Use of Internet Appliances in the Corporation, U.S.*, 1996

- *Use of Internet Appliances in the Corporation, Europe*, 1996

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II
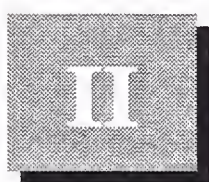
Executive Summary

A

NC Usage Currently Low, But Set to Rise Dramatically

As of mid- to late-1997, only a small proportion of organizations were using NCs (Java terminals, hybrid terminals and Windows terminals), either in trials or for live applications. Ten percent of survey respondents were using NCs at the time of interviewing, with a further third considering their use. Exhibit II-1 shows the state of NC usage as of mid-1997.

Exhibit II-1

State of NC Usage

Using NC for live applications 2%

Currently running a pilot 8%

Currently considering 34%

Not using and not considering 44%

Considered and rejected 12%

Sample: 50   Source: INPUT
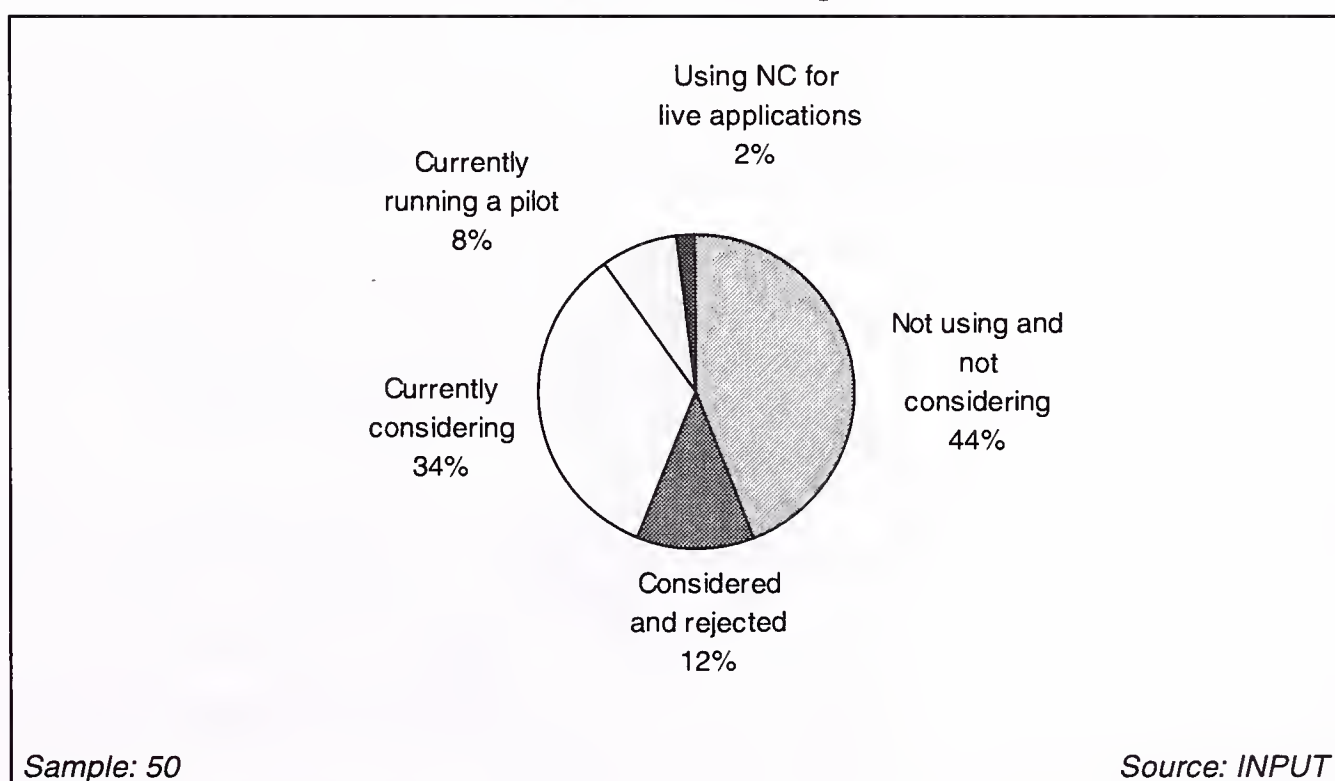
Overall, respondents did not consider it likely that they would be using NCs for live applications (as opposed to pilot schemes) by mid-1998. Most respondents rated the possibility at only 1 or 2 out of 5.

Despite this negative response, the NC market is changing extremely rapidly, due primarily to the convergence of NCs and Windows—NCs are increasingly being used to access host-based Windows applications, and NC-like features are being built into PCs. INPUT expects the actual uptake of thin clients (not delineated by strict architectural definitions, and including NCs, Windows terminals, and NC-like PCs) to be considerably higher than the current take-up rate of NCs might suggest; worldwide shipments will rise from 300,000 in 1997 to 18 million in 2002.

B
Client Devices Will Diversify, But Windows Will Remain the Default Environment

Much of the drive behind NCs has been their role in not only displacing PCs but also in creating a new application environment, based on Java. This has yet to occur, and INPUT forecasts that, while client platforms will diversify in terms of underlying technology and architecture, the application environment of users will remain mostly Windows-based.

Most users looking to reduce client support costs and administrative overhead have not moved to a NC environment. The changes required in application architecture and partitioning, and the level of application availability are unknown to many users, prompting a "do nothing" response. The release of Windows Terminal Server, however, following Microsoft's licensing of Citrix' NT multi-user technology and ICA (intelligent console architecture) protocol will change that situation drastically. With a degree of comfort, users will be able to replace clients with Windows terminals while retaining their existing applications, running on the server instead of the client.

NC vendors will achieve greatest success in providing low-cost, low-support front ends to server-based Windows and legacy applications. For this reason, hybrid NCs and Windows terminals will account for more NC sales than will Java devices. NC vendors have recognized this: Wyse, NCD, Neoware, and Tektronix all target Windows as well as terminal users in their offerings.

This is backed up by the findings of this survey. There is some correlation between the proportions of client platforms in current use and users' perceptions of the best-suited NC type for their organization. Exhibit II-2 shows client platform use by respondents.

Exhibit II-2

Client Platforms in Current Use

UNIX
12%

Terminal
(X/mainframe)
21%

PC/Mac
67%

Sample: 40   *Source: INPUT*
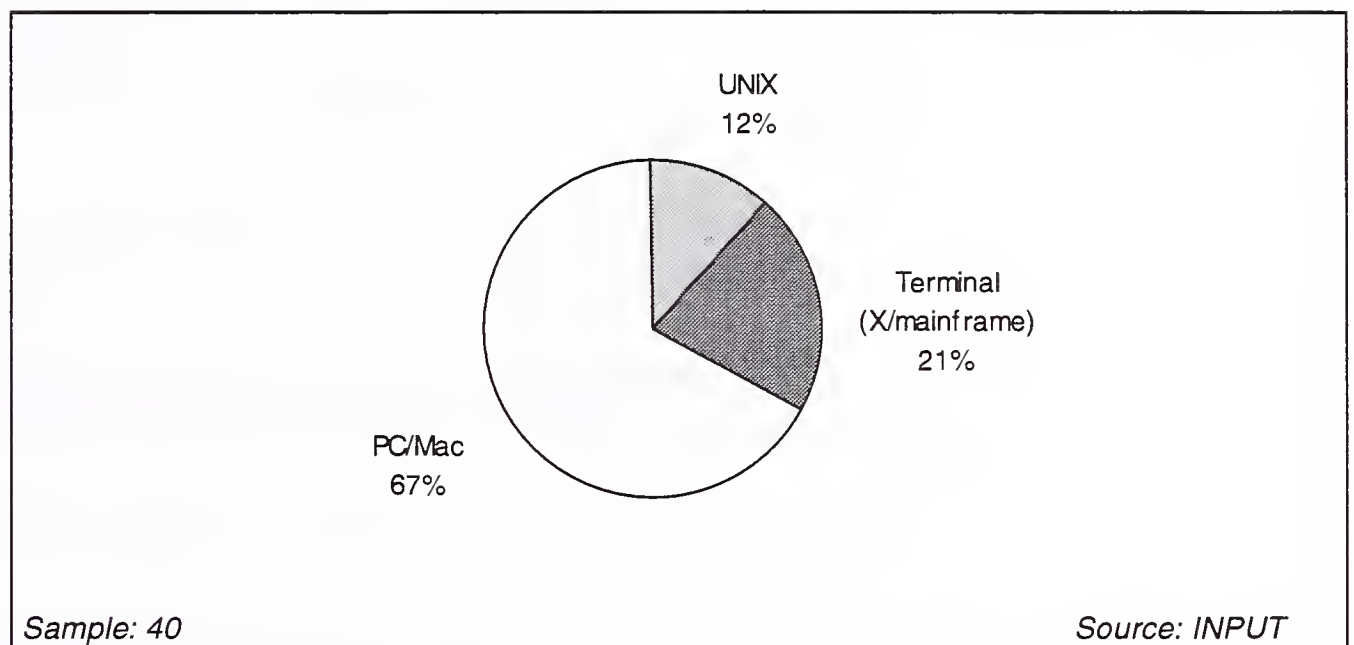
Exhibit II-3 shows the proportions of respondents that considered each of the three types of NC most suitable to their existing environments.

Exhibit II-3

Best Suited NC Type for Current IT Environments

Don't know
12%

Java terminal
18%

Windows
terminal
54%

Hybrid
terminal
16%

Sample: 50   *Source: INPUT*
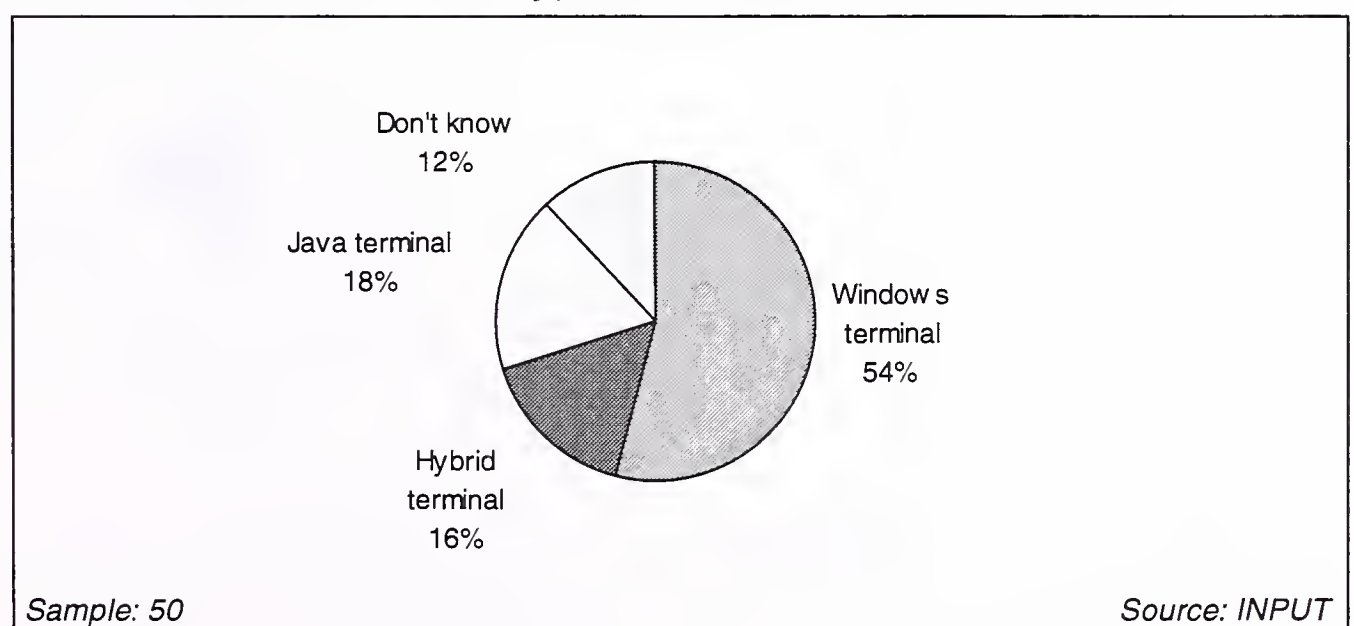
The proportions of users stating each NC type are similar to the existing breakdown of client platforms. Twelve percent of client platforms across the sample organizations run UNIX, and 18% of respondents considered Java terminals best suited to their existing environment.

Similarly, 21% of clients are mainframe/X terminals, and 16% of users regarded hybrid terminals as most suitable.

INPUT attributes this correlation to the likelihood that NCs will be deployed along architectural lines:

- Java terminals will tend to be placed in UNIX (particularly Sun) environments, despite Java's ability to run on most platforms.

- Hybrid terminals will tend to be placed in environments of mixed servers (mainframe, mini, Windows and UNIX).

- Windows terminals, naturally, will tend to be placed in Windows environments.

In addition, users consider Windows NT to be the most suitable server operating system for supporting NCs. While UNIX and NT received similarly high ratings for suitability in an NC environment, when asked to select the single most suitable operating system, NT was stated by around two thirds of respondents and UNIX by a quarter (Exhibit II-4).

Exhibit II-4

Most Suitable Server for NCs

Netware server 7%

IBM AS/400 9%

UNIX server 22%

Windows NT 62%

Sample: 48   *Source: INPUT*
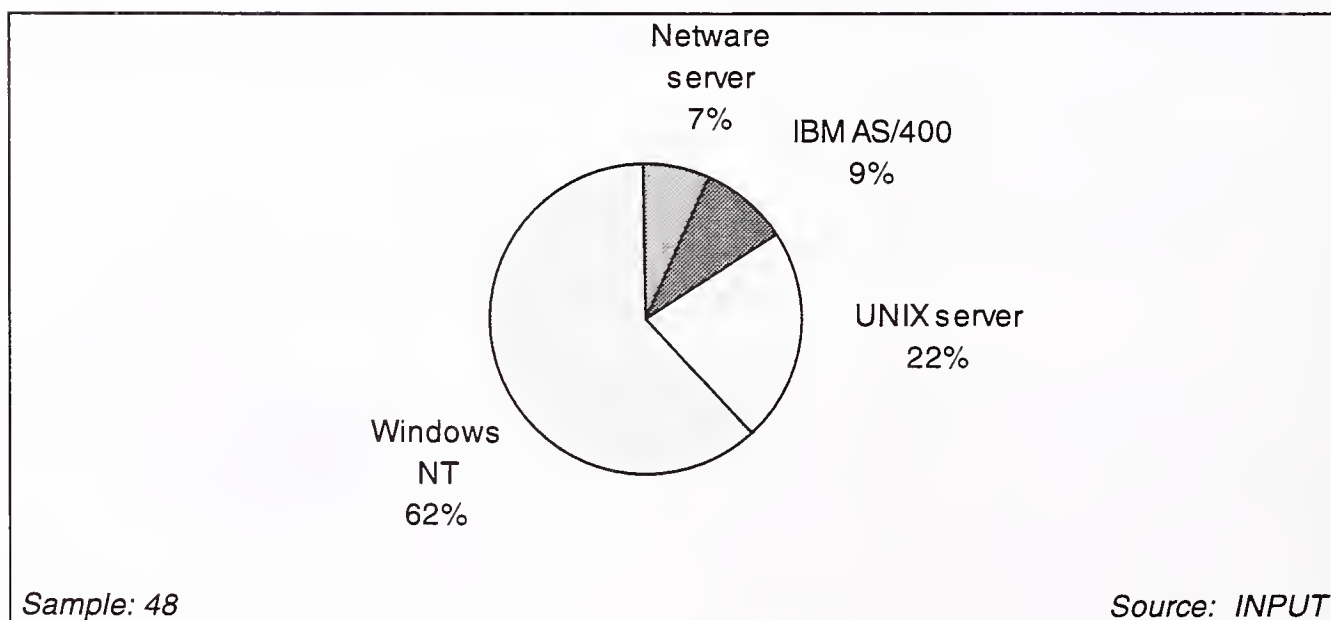
INPUT concludes that the most common NC environment will be hybrid terminals capable of fronting Windows and legacy applications, or dedicated Windows terminals, sharing a Windows NT or Windows Terminal server.

By 2002, NCs with a Windows presentation capability will represent 70% of NC shipments, the remaining 30% comprising legacy-only or Java-only NCs.

C
Network Upgrades Are Required For Widespread NC Deployment

PCs are not, fundamentally, network devices, and only relatively recently have PCs been sold with pre-installed network cards and networking capabilities built into the operating system.

Throughout much of its history, the PC has been a standalone device, and most application software has assumed the model of a standalone, or at least heavily localized client. Application software is becoming network-based, but much network traffic is still simple file transfer and print spooling.

The centralized, server-based NC model puts the network at the heart of the IT infrastructure, by design, and so demands a robust, scaleable, high-performance network architecture. For NCs of all types to be deployed on a large scale, network infrastructure must be upgraded in most organizations.

Standard 10Mbps Ethernet is the most widespread network architecture, used as a primary corporate network by 70% of respondents, and Token Ring still retains a relatively large installed base, used by one fifth of respondents. Fast Ethernet (100Mbps) is used as a primary network by only 14% of respondents.

However, 10Mbps Ethernet and, to a lesser extent, Token Ring are not regarded as properly suited to the demands of a NC environment, as Exhibit II-5 shows. Only network types with low penetration (Fast Ethernet and ATM) are regarded as suitable (very few respondents rated ATM's suitability, but the ratings received were high).

In addition, when asked to select the network most suitable to a NC environment, 100Mbps Ethernet was the favored choice, with 56% of respondents. ATM followed, chosen by 25%.

The disparity between Fast Ethernet's and ATM's perceived ability to support the requirements of NC users and their current penetration indicates the need for widespread changes in network infrastructure to take place for NCs to achieve their potential.

Users recognize the need for such upgrades, and the associated support requirements: around half of users expect NCs to increase network and communications costs.

Exhibit II-5

Suitability of Network Platforms for NCs

Sample: 24   *Source: INPUT*
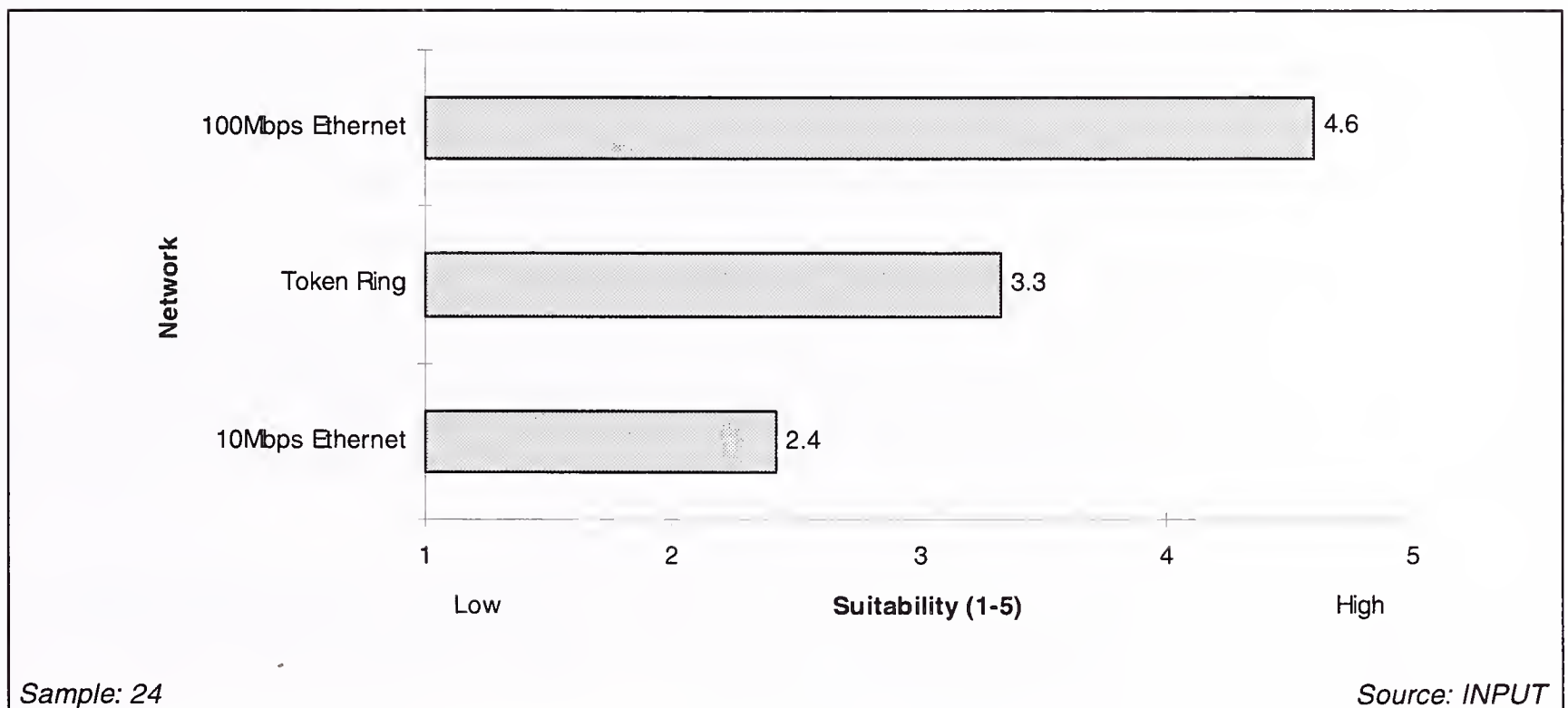
D

NCs Address PC Shortcomings, But PCs Are Responding

From their inception, NCs were promoted as a solution to long-standing problems with the PC model, those problems being: high degree of localization, high complexity, and resultant high support costs. The NC solution results in lower localization (greater centralization), less complexity for user and administrator, and subsequent lower support costs.

In highlighting these issues, NC proponents have prompted PC vendors to respond. Examples include:

- Microsoft—first issued the NetPC reference specification, followed by the "Zero Administration" initiative. Microsoft's current thin client strategy, Windows Terminal Server, will boost the NC market considerably and in addition will enable Microsoft to compete in the multi-user server market against UNIX vendors.

- Intel—acquired 4.4% of NCD and licensed technology to NCD so that the latter may manufacture Intel-specified thin clients. NCD also manufactures IBM's Network Station range of NCs and develops and markets its own range of Explora thin clients, based on the company's previous X terminals.

- SNI—among the first vendors to release a PC based on the NetPC specification, including a sealed unit, no floppy disk drive, and smartcard access security.

As stated previously, NCs able to present Windows applications running on an NT server will represent most of the NC market. With the final release of Windows Terminal Server (due second quarter of 1998), PC vendors will enter the NC market currently held by IBM, Neoware, Wyse, NCD, and others.

12   EI37U

Despite the shape of the future client platform market, most of the current PC installed base is suffering from the existing, long-standing problems. Exhibit II-6 shows the characteristics of client platforms (not specifically PCs or NCs, but all client platforms) that respondents rated as most important.

Three of the five characteristics shown are those, which INPUT identifies as fundamental strengths of NCs—security, support costs, and centralized system management.

Exhibit II-6

Most Important Client Platform Characteristics

Characteristic	Importance (1-5)
Security	4.4
Support cost	4.2
Mobile working capability	4.1
Centralised system management	4.0
Performance	4.0

Sample: 44   Source: INPUT
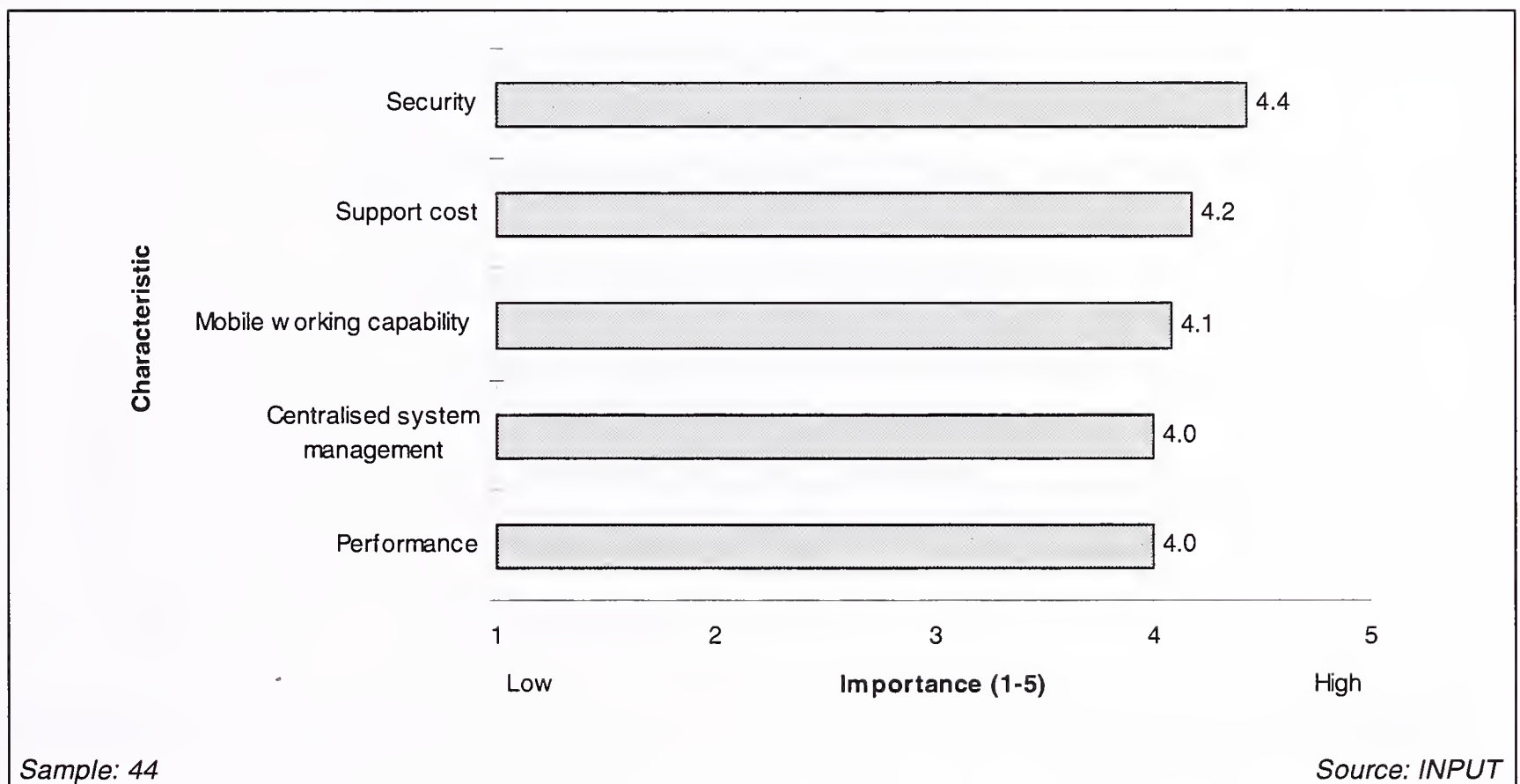
Exhibit II-7 shows the characteristics of PCs that respondents rated most highly for satisfaction. The top three characteristics are not fundamental NC strengths. There is a tendency for NCs to be strong in those areas where PCs are rated lowest. For example, PCs were rated poorly for centralized application and data management, but NCs are inherently strong in this area.

Exhibit II-7

PC Characteristics Receiving High Satisfaction Ratings

Sample: 43   Source: INPUT
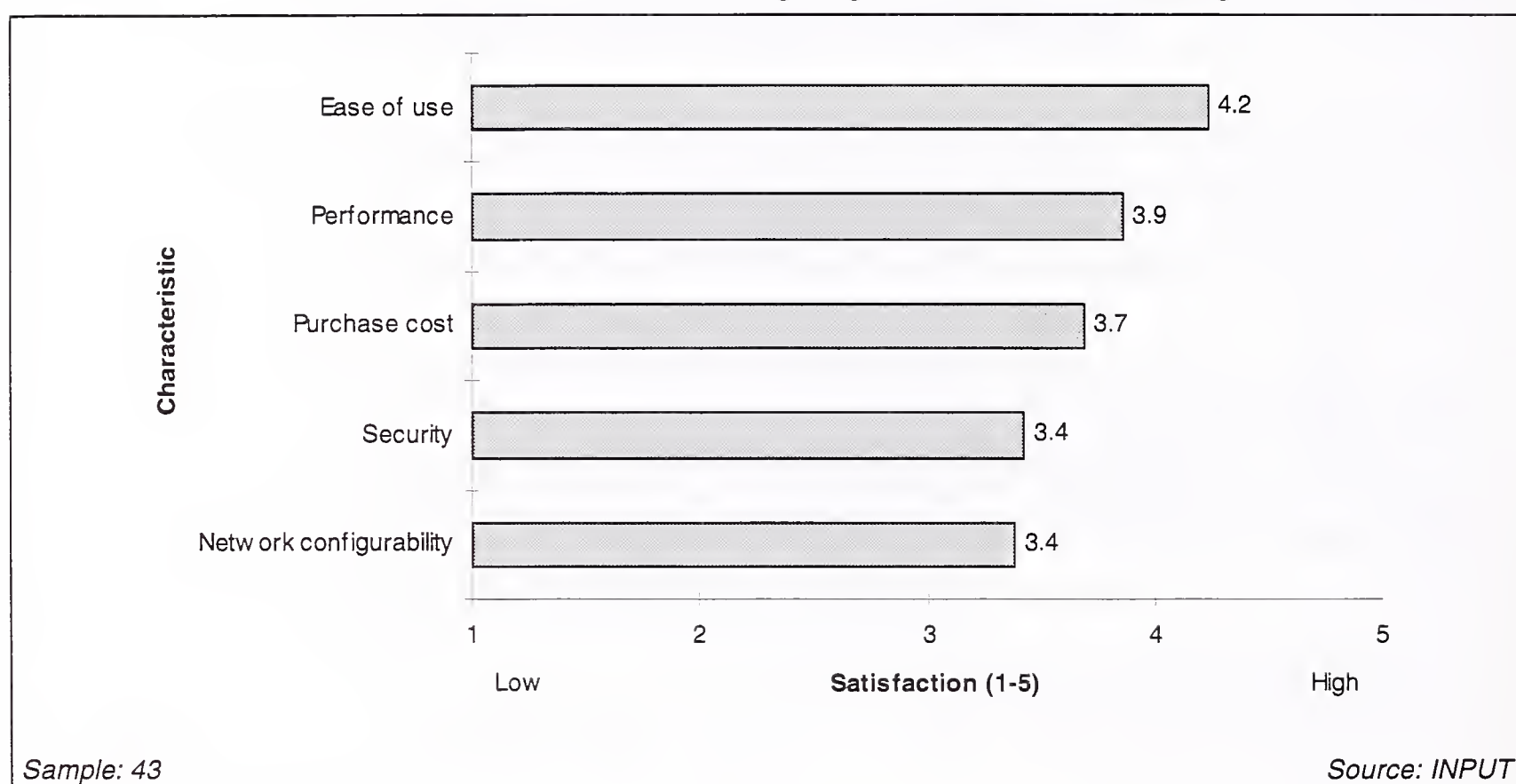
As a further illustration, Exhibit II-8 shows the importance of client platform characteristics plotted against satisfaction with PCs for the same characteristics. The categories, which INPUT identifies as NC strengths, are marked with a white cross.

The only category in which PCs perform noticeably well compared with

its importance is ease of use. With the exception of mobile working, the categories in which PCs perform worst—support costs, centralized application and data management, and centralized system management—are all basic strengths of NCs.

Exhibit II-8

PC Characteristics: Importance vs Satisfaction

Sample: 44

Source: INPUT
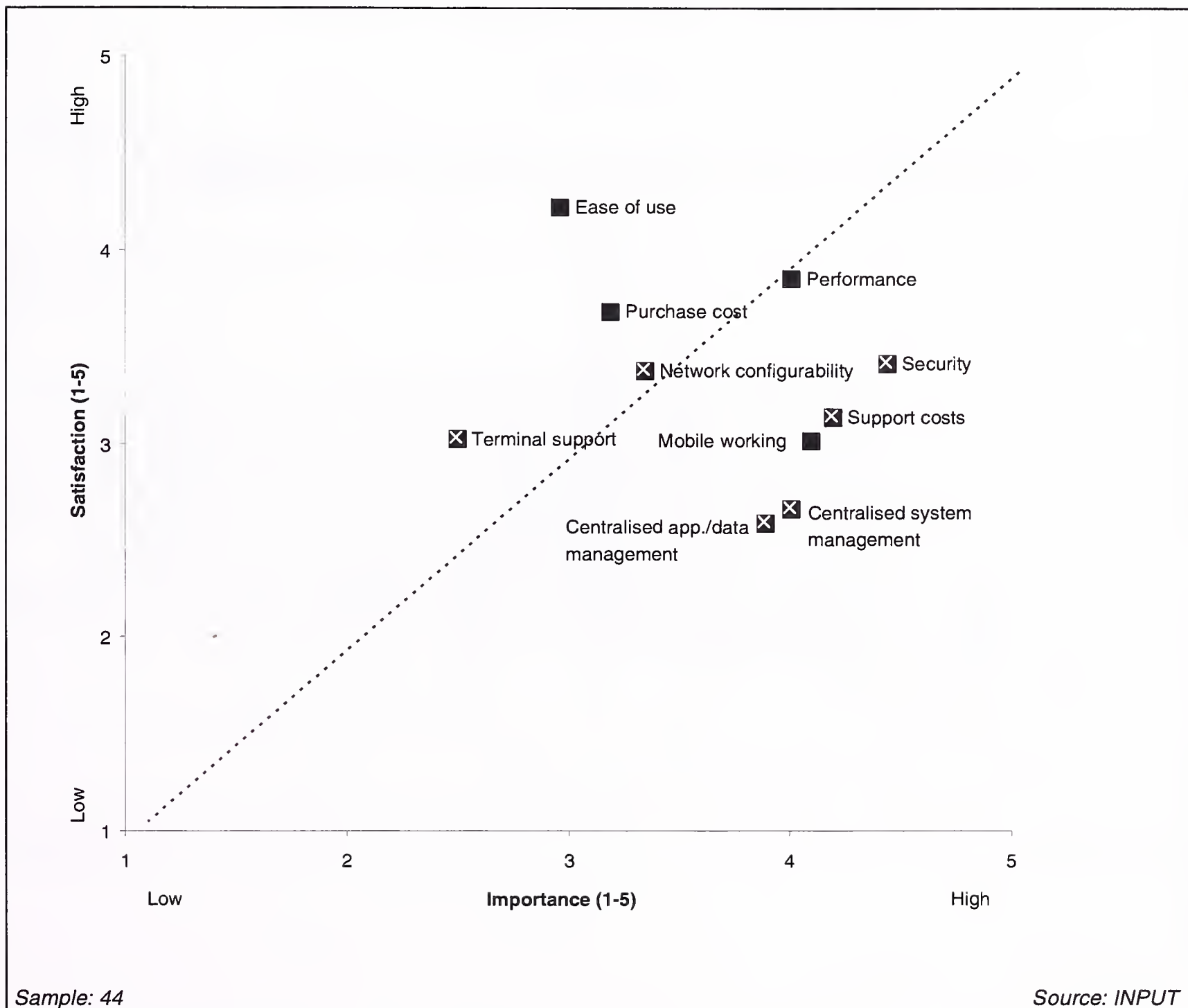
Exhibit II-9 summarizes the major strengths and weaknesses identified by users of PCs and NCs.

Exhibit II-9

PC/NC Strengths and Weaknesses

Platform	Main Strengths	Main Weaknesses
PC	Flexibility	Administration overhead and cost
	Application support	
	Ease of use	
NC	Low administration overhead and costs	Unproven concept and technology
	Centralized environment	Lack of functionality

Source: INPUT

The introduction of a Windows-based thin client framework backed by Windows Terminal Server goes a long way to addressing current PC shortcomings. Windows terminals gain the strengths of NCs while tackling the administration problems of PCs. In doing so, they also gain a perceived weakness of NCs, dependence on a back-end server and network. INPUT does not view this dependence as a fundamental weakness or limitation, but as an architectural shift that is a prerequisite for network computing.

E

NCs Will Shift Support Costs From End User to Server and Network

NCs will reduce client support costs, but the changes in support costs vary widely across the spectrum of IT, from desktop-level end-user support to server and network support.

Exhibit II-10 details of the amount of change in end-user support costs expected by respondents—a decrease of up to 40% overall.

Exhibit II-10

Expected Detailed Change in End User Support Costs With NCs

Sample: 32   Source: INPUT
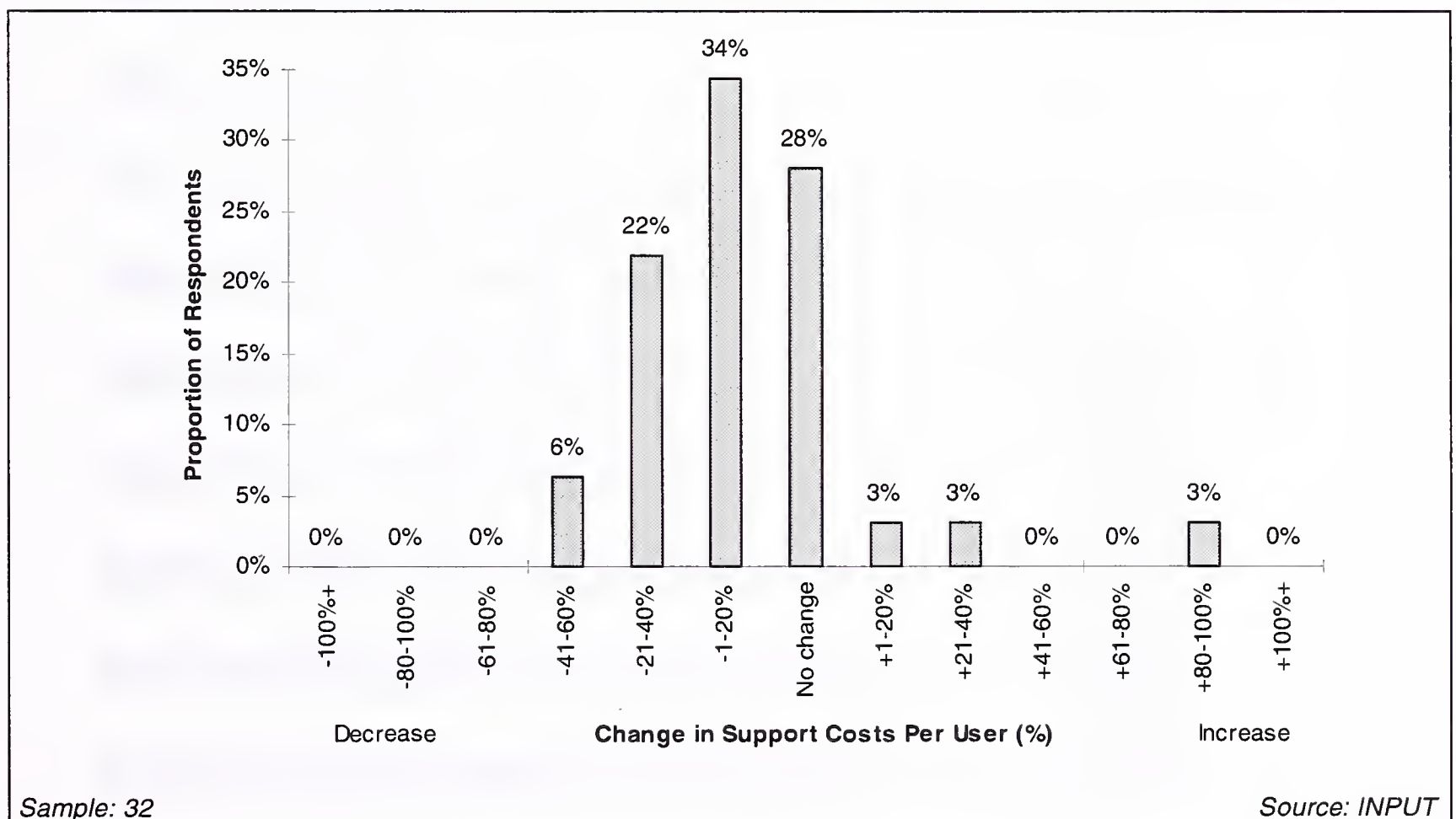
Users do not view NCs as cost saving devices when the whole IT infrastructure is considered, however. On average, over a third of respondents expect server-related support spending to increase in a NC environment, and around half anticipate cost increases in network and communications-related support.

Exhibit II-11

Expected Change in All Support Costs With NCs

Legend: □ Decrease ▨ No change ■ Increase

Category	Decrease	No change	Increase
Client application software support	59%	32%	9%
Client system software support	59%	32%	9%
Client hardware support	59%	32%	9%
In-house software development	18%	59%	23%
End user education and training	18%	59%	23%
Server hardware support	14%	59%	27%
Server application software support	9%	59%	32%
Server system software support	9%	45%	45%
Network/comms support	9%	36%	55%

Proportions of Respondents

Sample: 22　　　　*Source: INPUT*

F
Market Forecasts

The market for NCs—Java, hybrid, and Windows—will grow at an extremely high rate between 1997 and 2002. Exhibit II-12 shows unit shipments for 1997 and 2002 for all NC types combined. Exhibit II-13 shows unit shipments by year between 1997 and 2002 for Windows-based NCs and other, non-Windows NCs (terminal replacements and Java-based devices).

Exhibits II-14 and II-15 show market value for NCs combined and for NCs by type.

Exhibits II-16 and II-17 show shipments and market value by region.

Exhibit II-12

Overall NC Shipments, 1997 and 2002—Worldwide

Source: INPUT
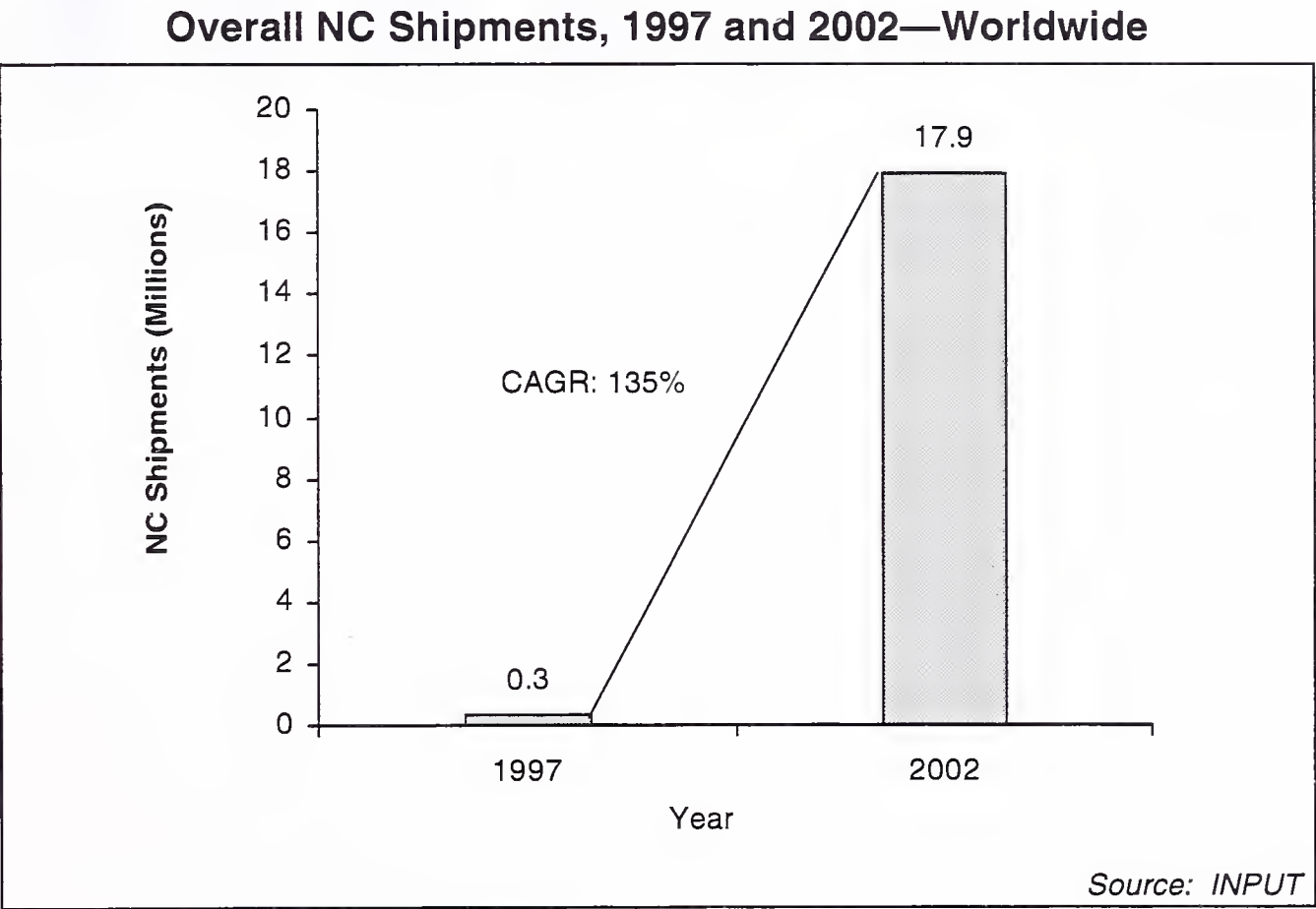
Exhibit II-13

NC Shipments by Type, 1997-2002—Worldwide

NC Shipments (Millions) vs **Year**

Legend:
- ☐ Other NCs
- ■ Windows terminals

Data shown on bars:
- 1999: 1.0 (Other NCs), 0.7 (Windows terminals)
- 2000: 2.2 (Other NCs), 2.2 (Windows terminals)
- 2001: 4.0 (Other NCs), 6.0 (Windows terminals)
- 2002: 5.4 (Other NCs), 12.5 (Windows terminals)
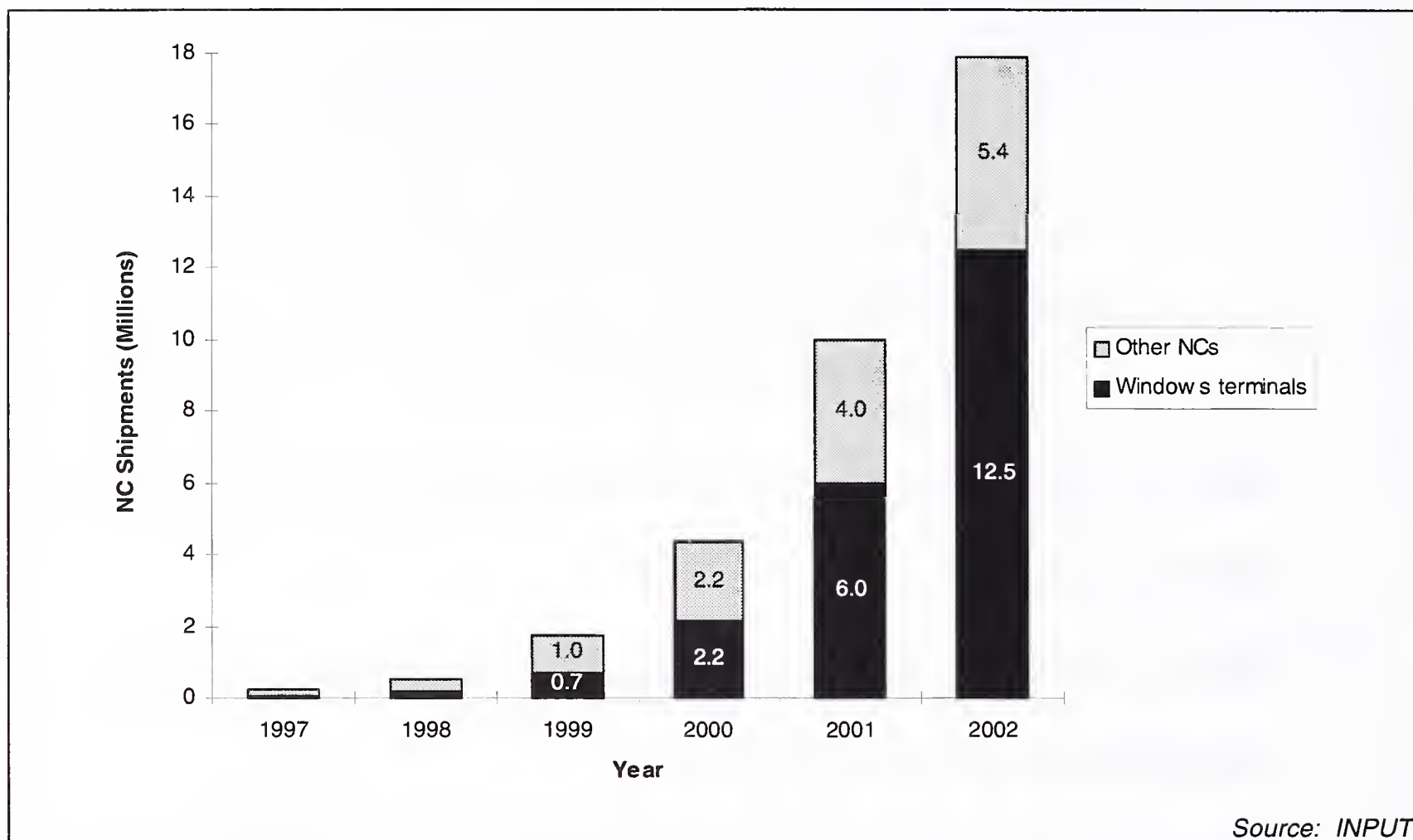
Exhibit II-14

Overall NC Market Value, 1997 and 2002—Worldwide

CAGR: 120%

Source: INPUT
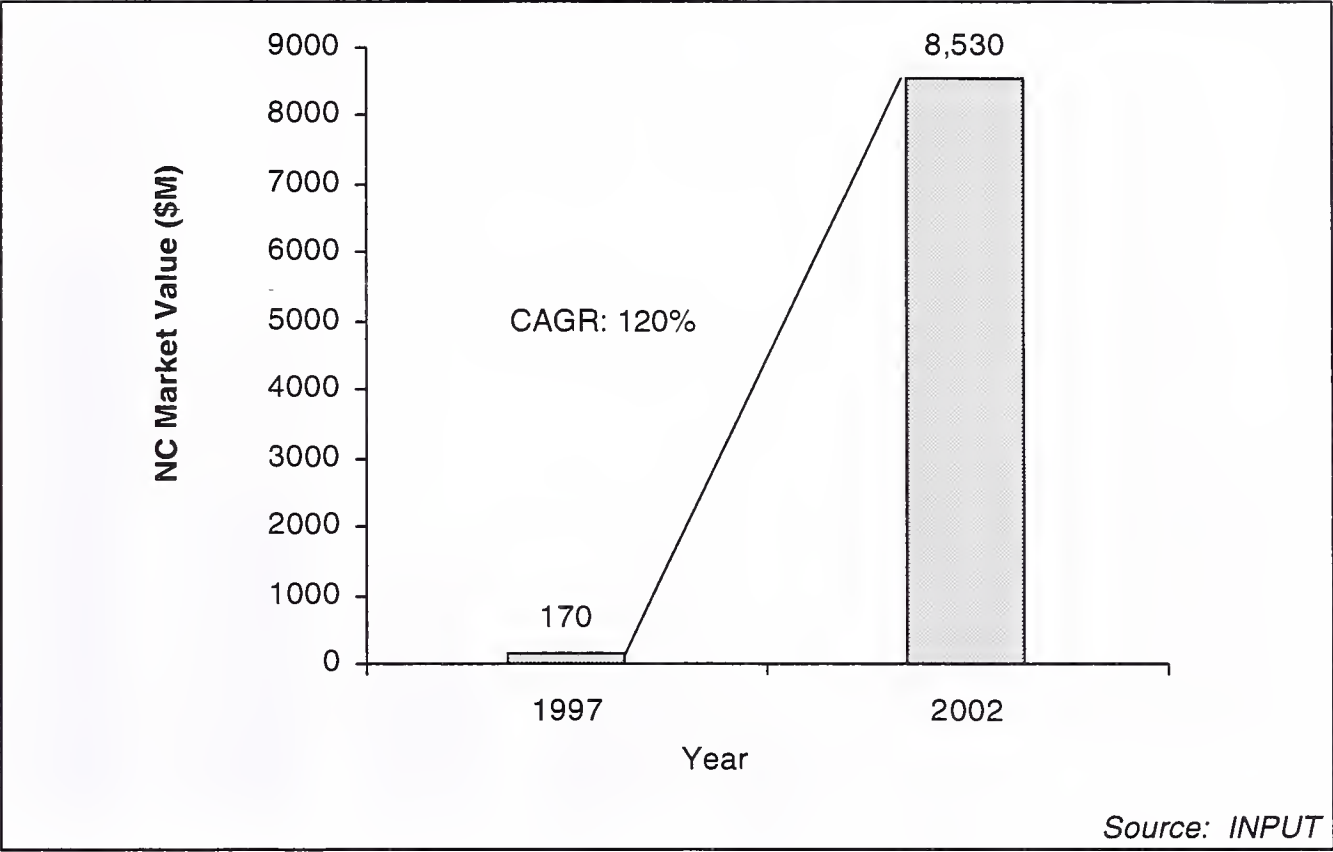
Exhibit II-15

NC Market Value by Type, 1997-2002—Worldwide

EI37U

Legend:
- ☐ Other NCs
- ■ Windows terminals

Data labels:
- 1997: 170
- 1998: 360
- 1999: 620 / 490
- 2000: 1,200 / 1,410
- 2001: 1,870 / 3,310
- 2002: 2,280 / 6,250

Y-axis: NC Market Value ($M), 0 to 9000

X-axis: Year

Source: INPUT
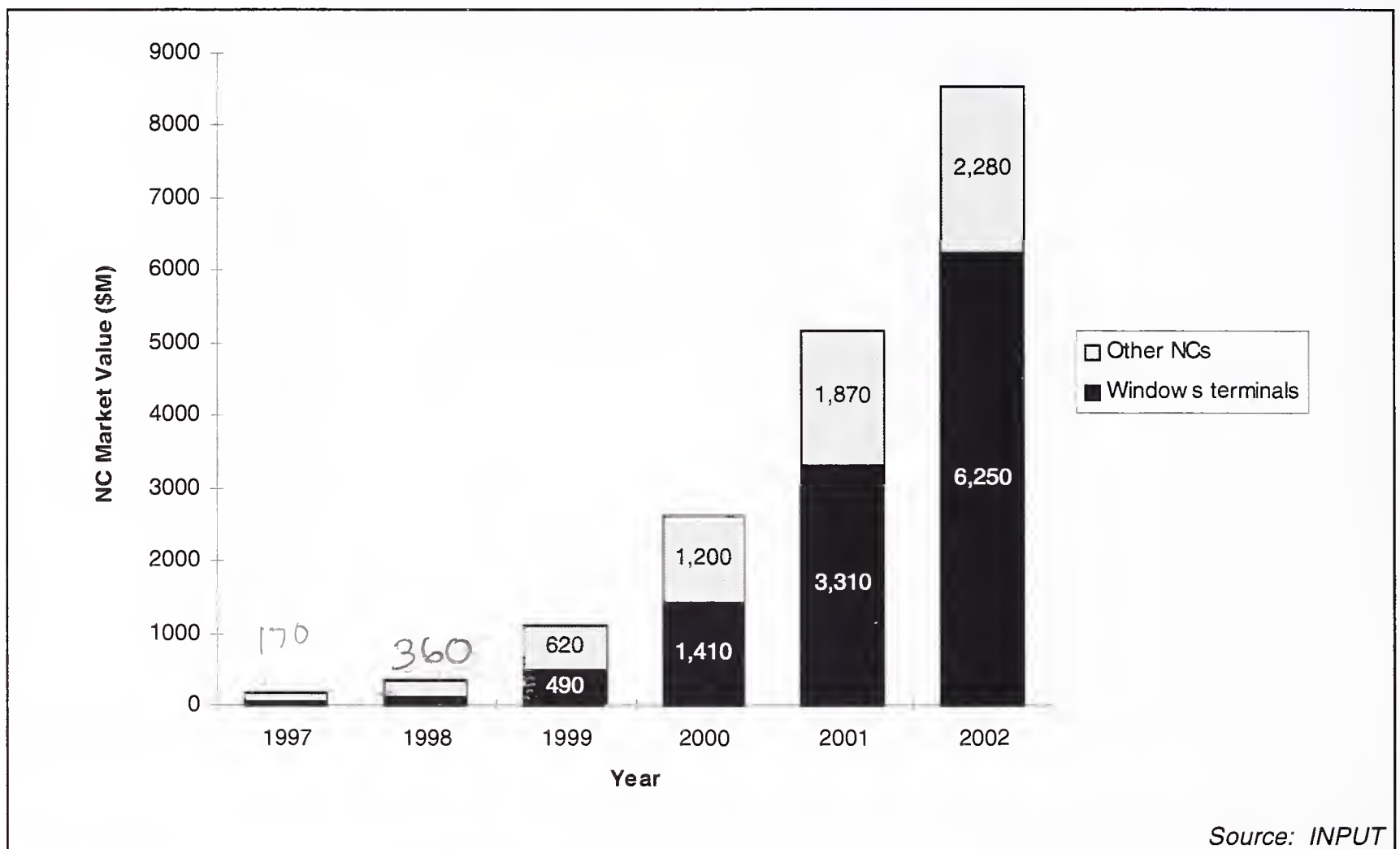
Exhibit II-16

NC Shipments, 1997-2002—by Region

Legend: □ Europe □ US ▨ Rest of World

Y-axis: NC Shipments (Thousands)

X-axis: Year

1997: 50, 190, 10
1998: 120, 370, 40
1999: 420, 1,130, 190
2000: 1,130, 2,600, 610
2001: 2,800, 5,510, 1,700
2002: 5,360, 8,930, 3,570

Source: INPUT
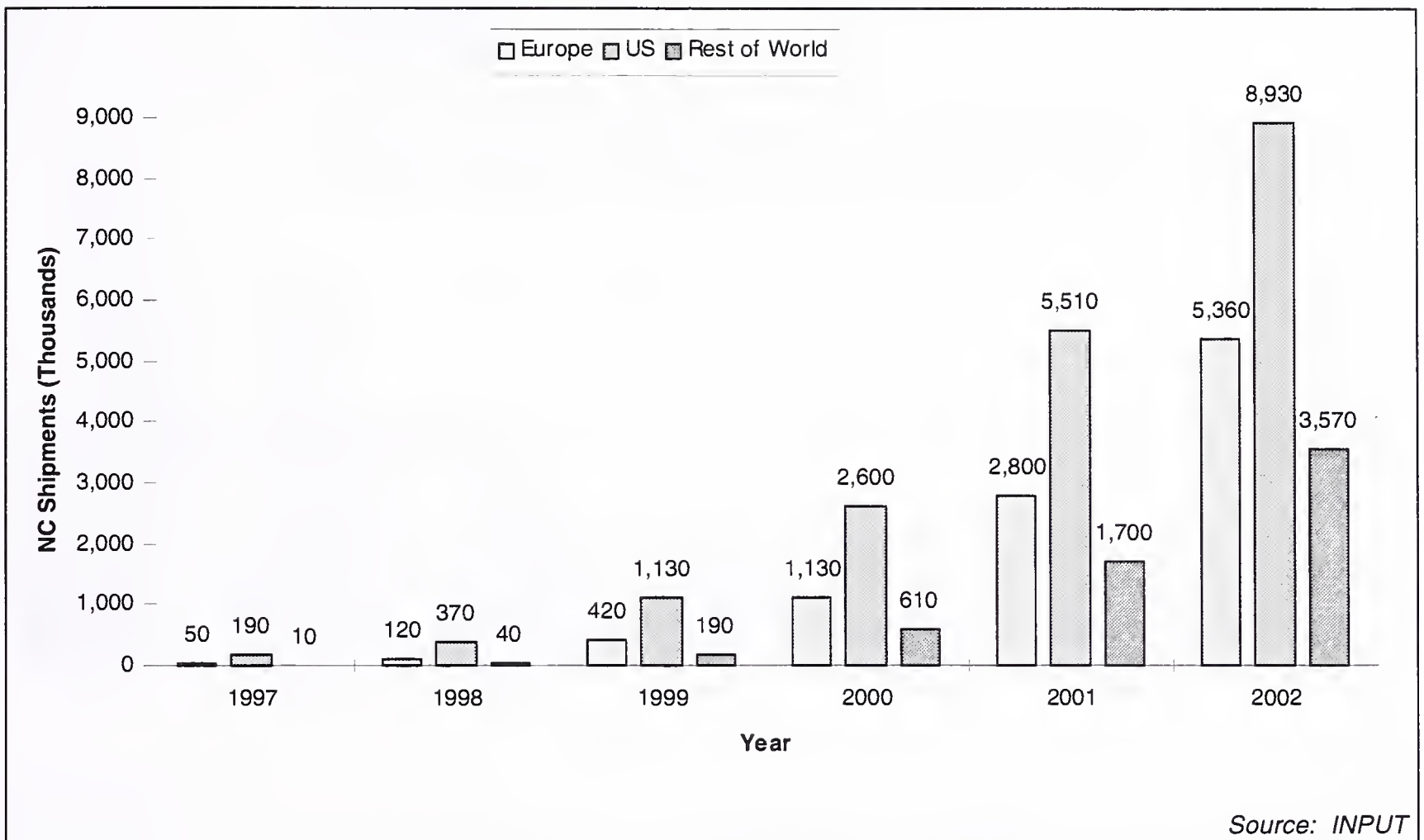
Exhibit II-17

NC Market Value, 1997-2002—by Region

III
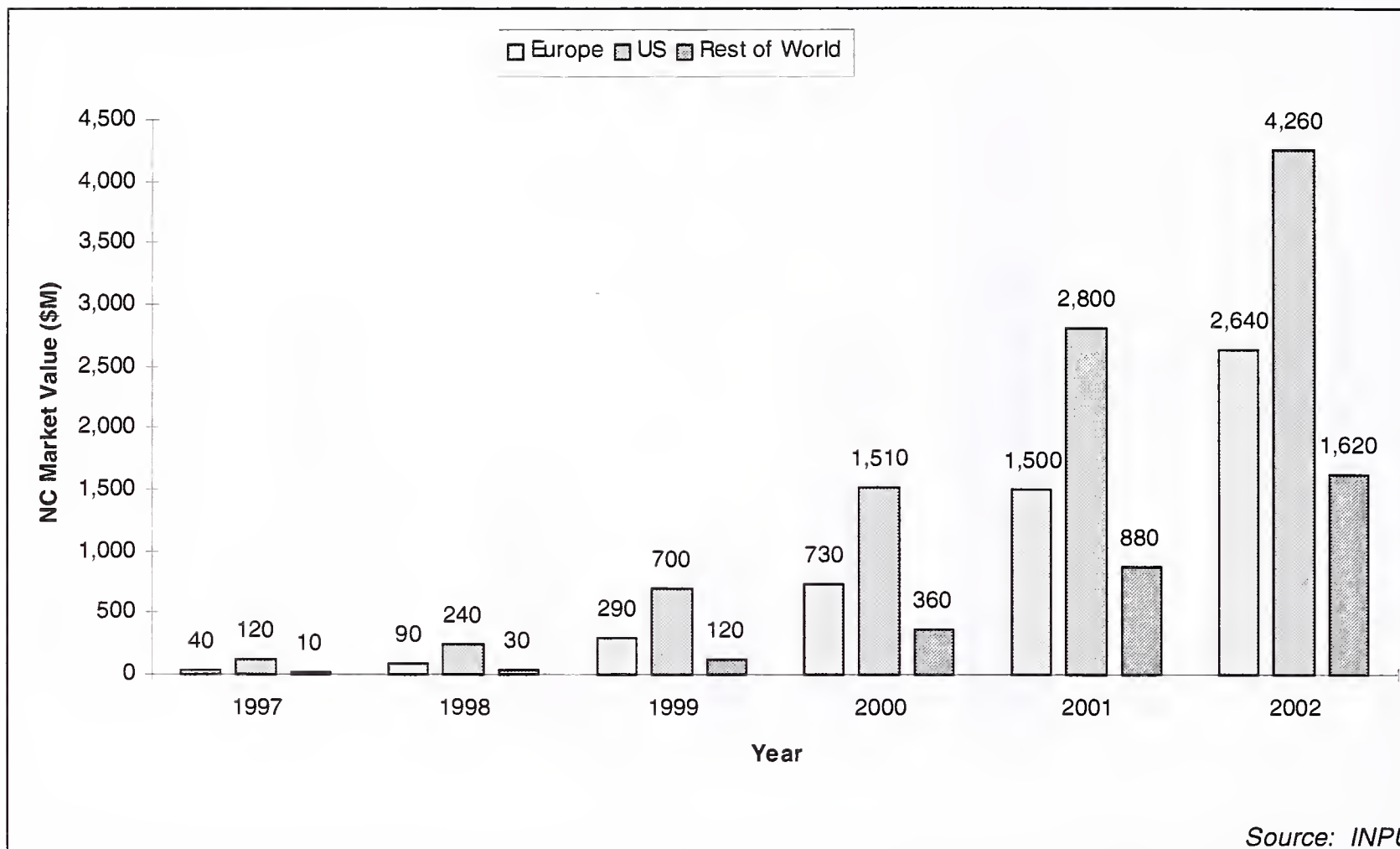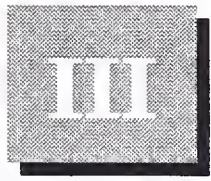
Current Platform and NC Usage

A

Current State of NC Usage

NCs are in use in around 10% of organizations surveyed. A third of respondents are currently considering their use, and nearly half have not yet evaluated NC use. Exhibit III-1 shows the state of NC usage as of mid-1997; Exhibits III-2 to III-5 show responses by industry sector.

Exhibit III-1

State of NC Usage

Currently running a pilot 8%

Using NC for live applications 2%

Not using and not considering 44%

Currently considering 34%

Considered and rejected 12%

Sample: 50   Source: INPUT
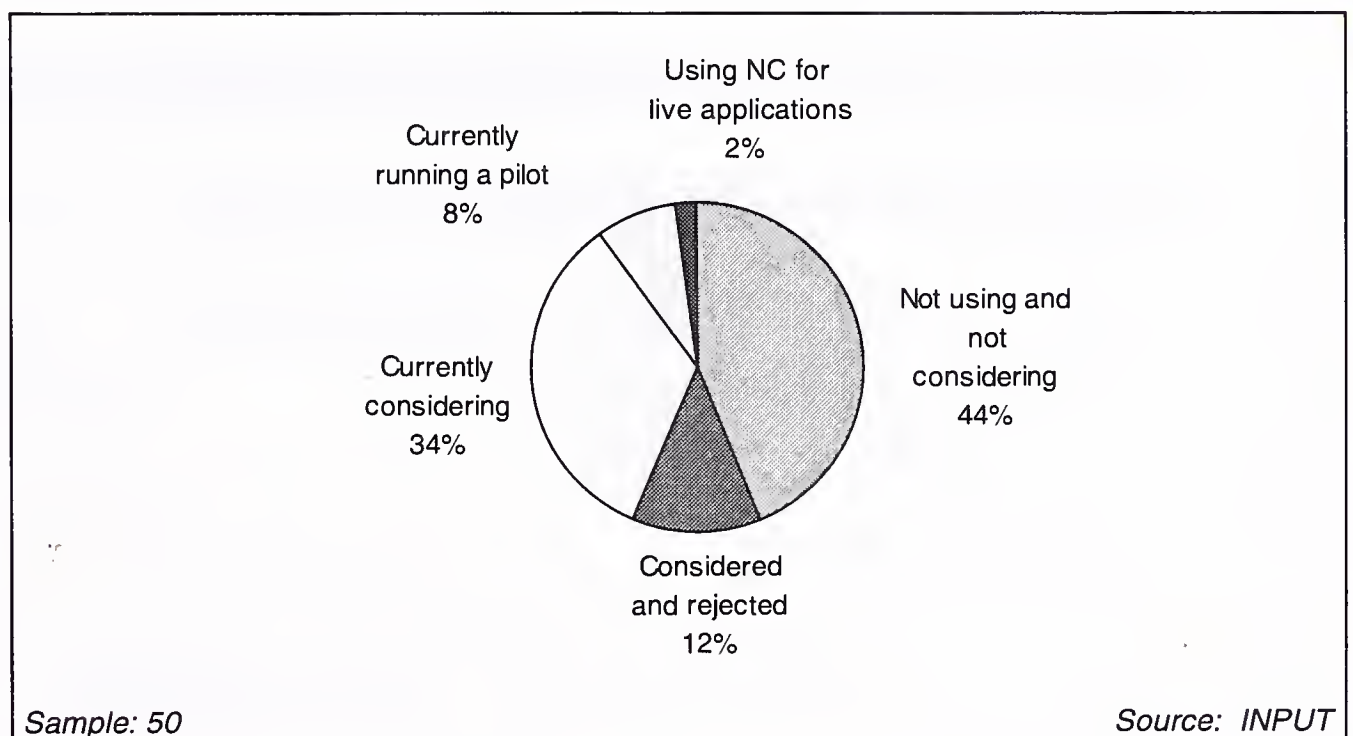
Exhibit III-2

State of NC Usage—Discrete Manufacturing

NC Usage

Not using and not considering	5
Currently running a pilot	2
Currently considering	2
Have considered and rejected	1
Using NC for live applications	0

Number of Respondents (0, 1, 2, 3, 4, 5)

Sample: 10   Source: INPUT
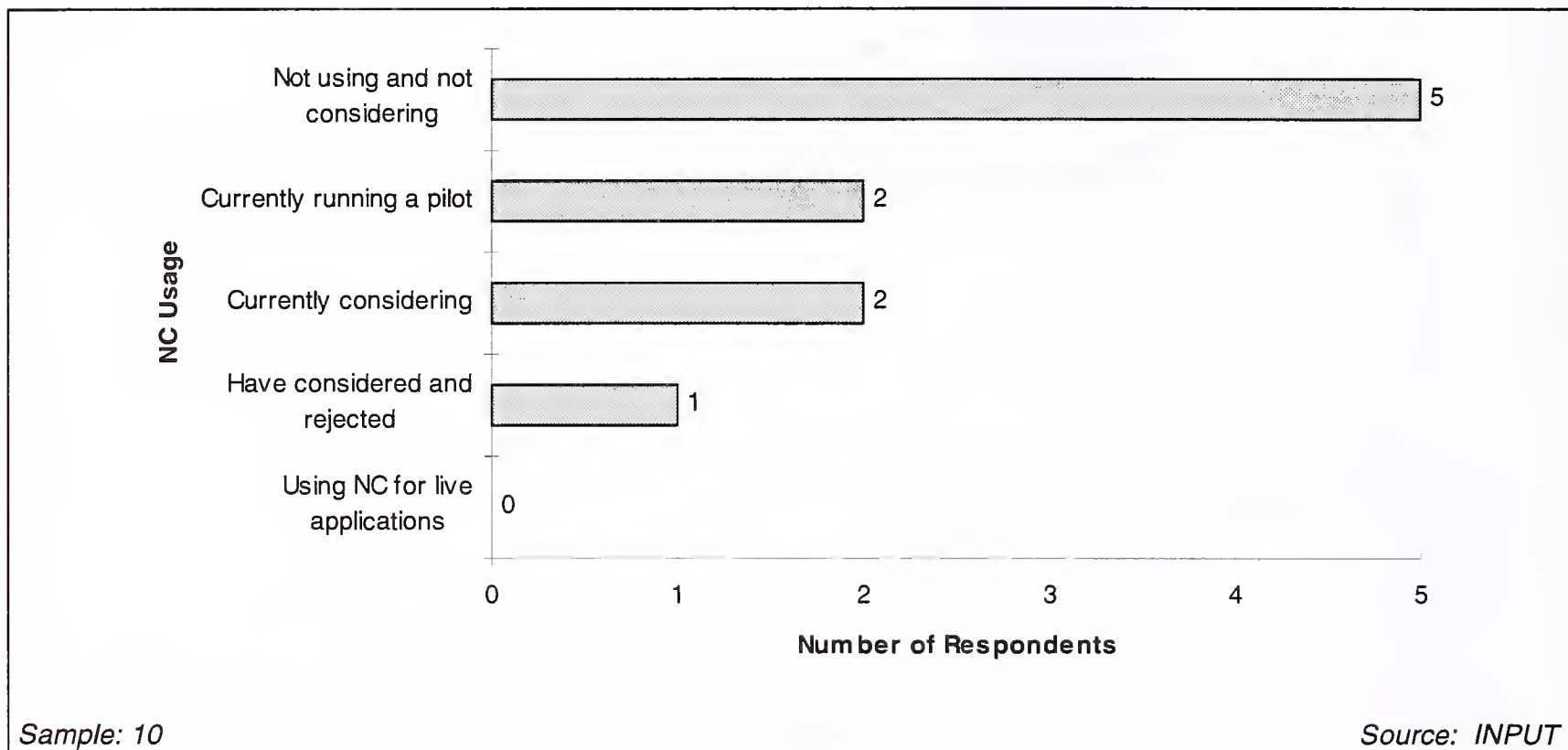
Exhibit III-3

State of NC Usage—Process Manufacturing

NC Usage

Not using and not considering	8
Currently considering	2
Using NC for live applications	1
Have considered and rejected	1
Currently running a pilot	0

Number of Respondents (0, 1, 2, 3, 4, 5, 6, 7, 8)

Sample: 12   Source: INPUT
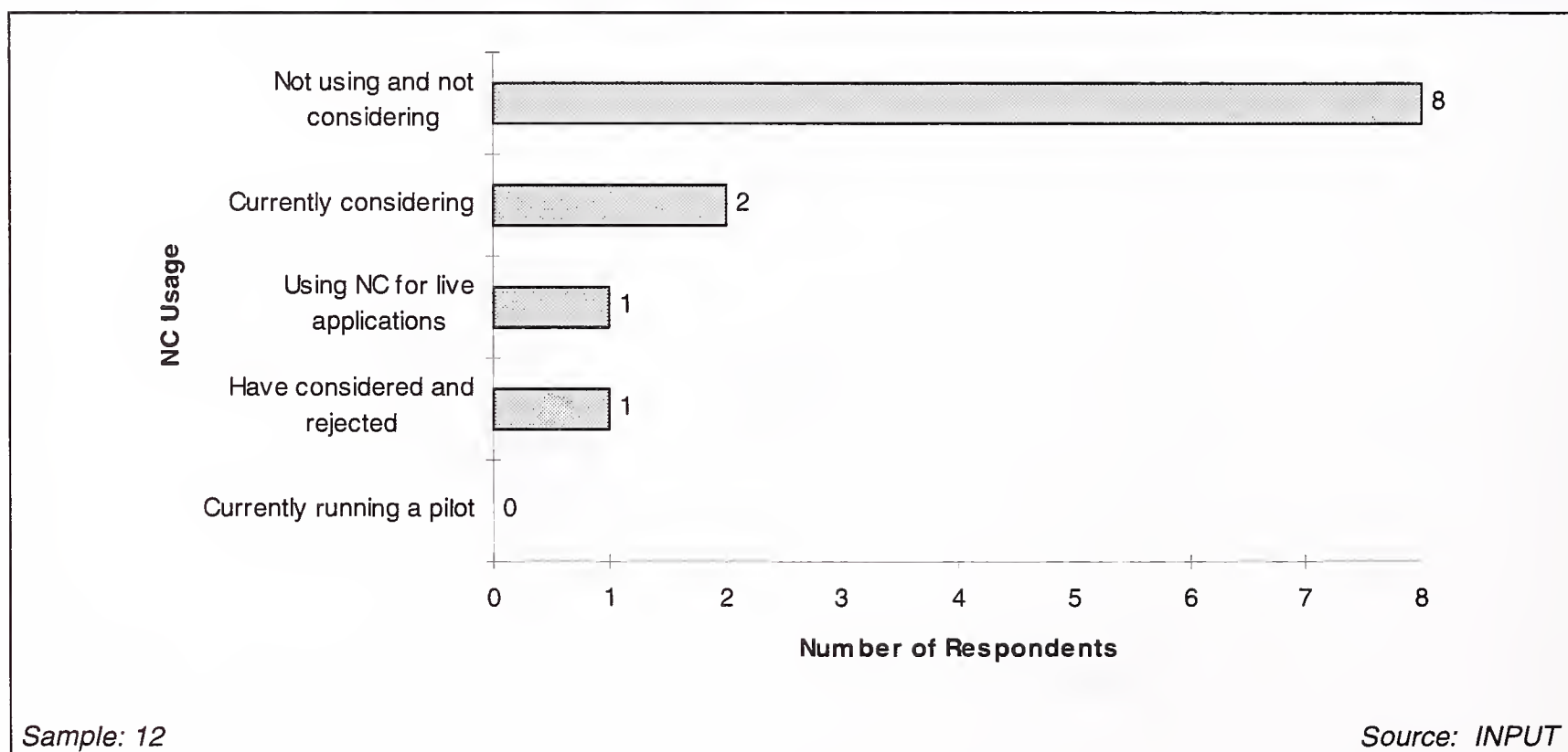
Exhibit III-4

State of NC Usage—Services
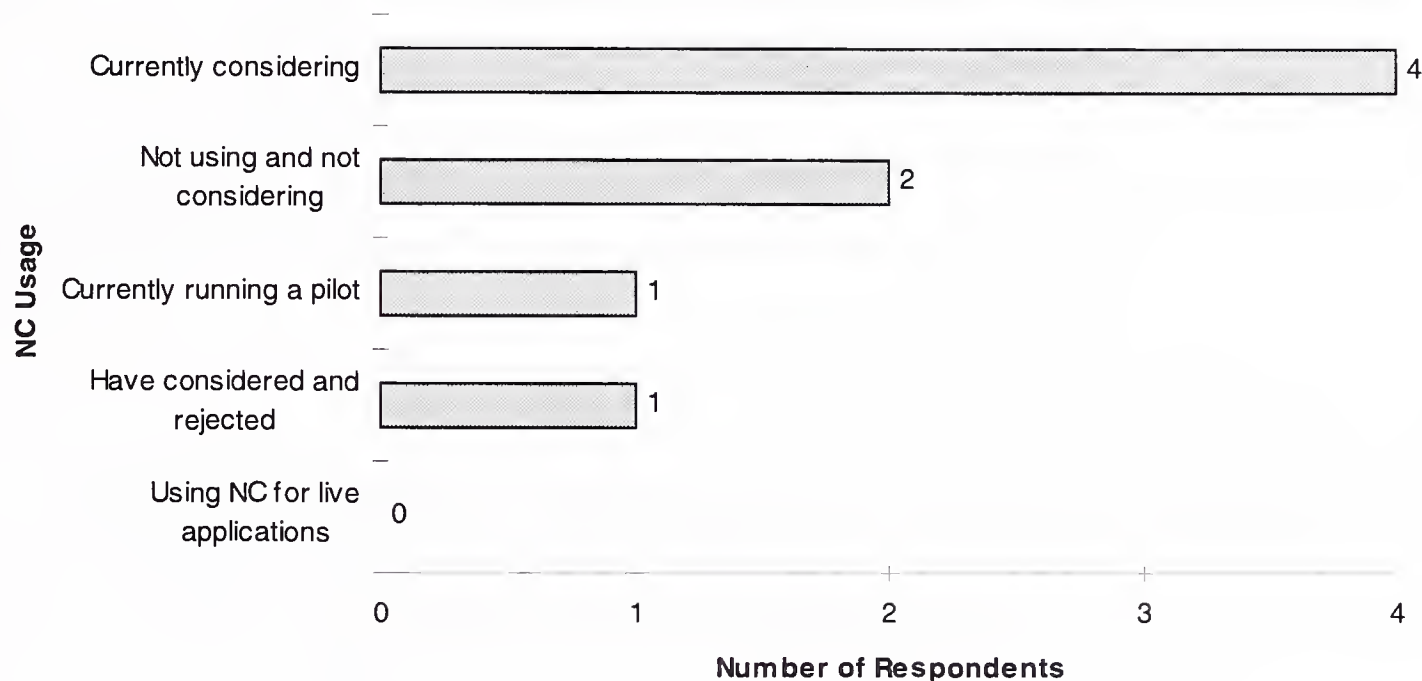
Sample: 8   *Source: INPUT*

Exhibit III-5

State of NC Usage—Wholesale
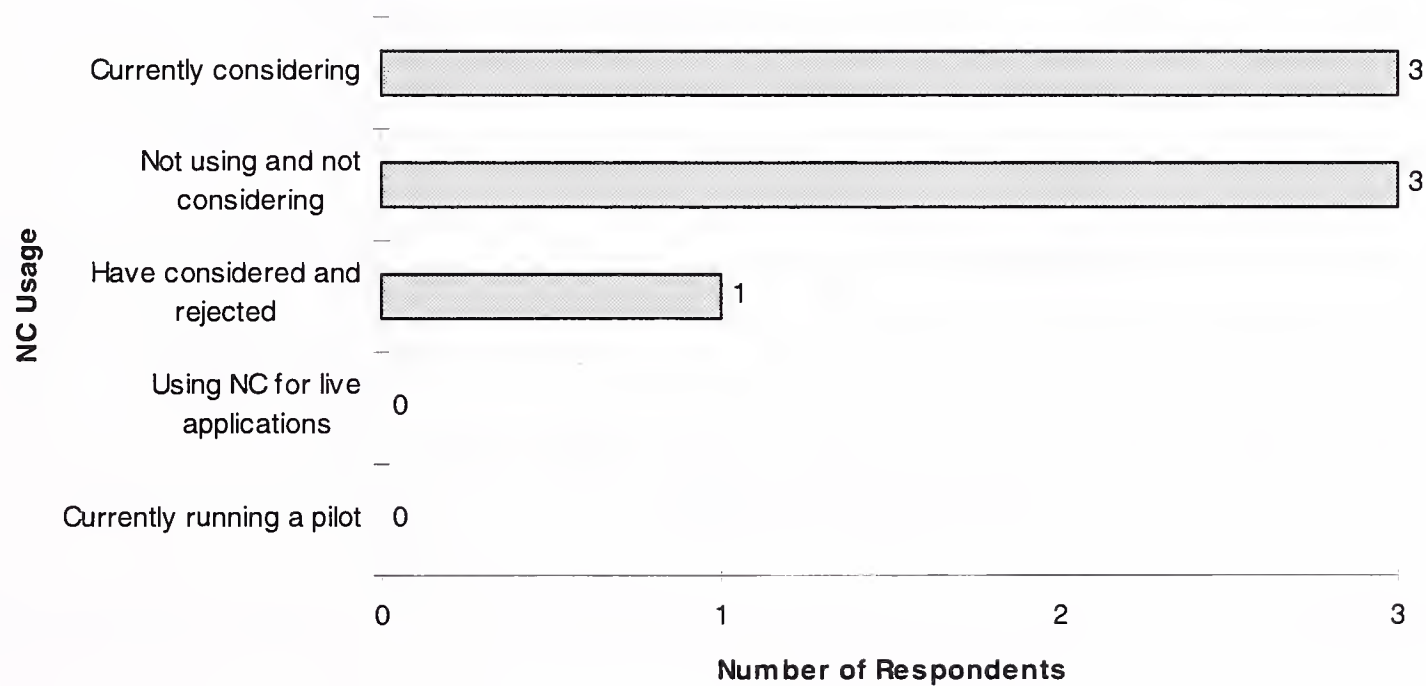
Sample: 7   *Source: INPUT*

B
Platforms in Current Use

1.   Client Platforms

Exhibit III-6 breaks down current client platforms in use across the surveyed organizations. Most client platforms are PCs (most running MS Windows, but also including other PC operating systems and Apple Macintoshes).

Exhibit III-6

Client Platforms in Current Use

UNIX
12%

Terminal
(X/mainframe)
21%

PC/Mac
67%
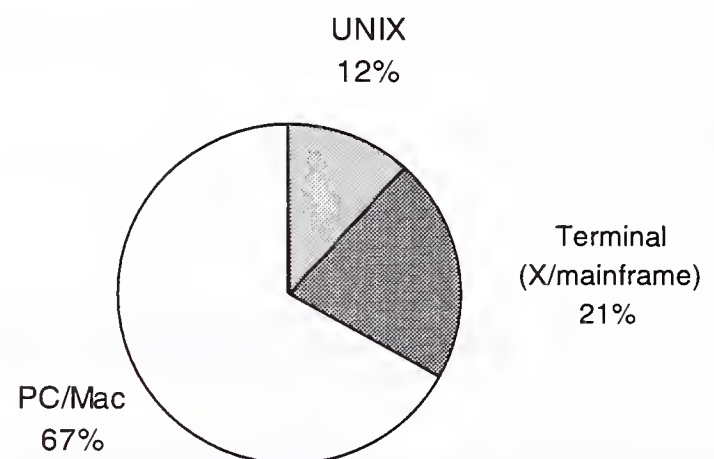
Sample: 40   *Source: INPUT*

2.   Server Platforms

Exhibit III-7 shows the primary server platforms currently in use. Windows has overtaken UNIX, and the use of Netware as a primary platform continues to decline from its peak of around 70% in the early 1990s.

Exhibit III-7

Server Platforms in Current Use
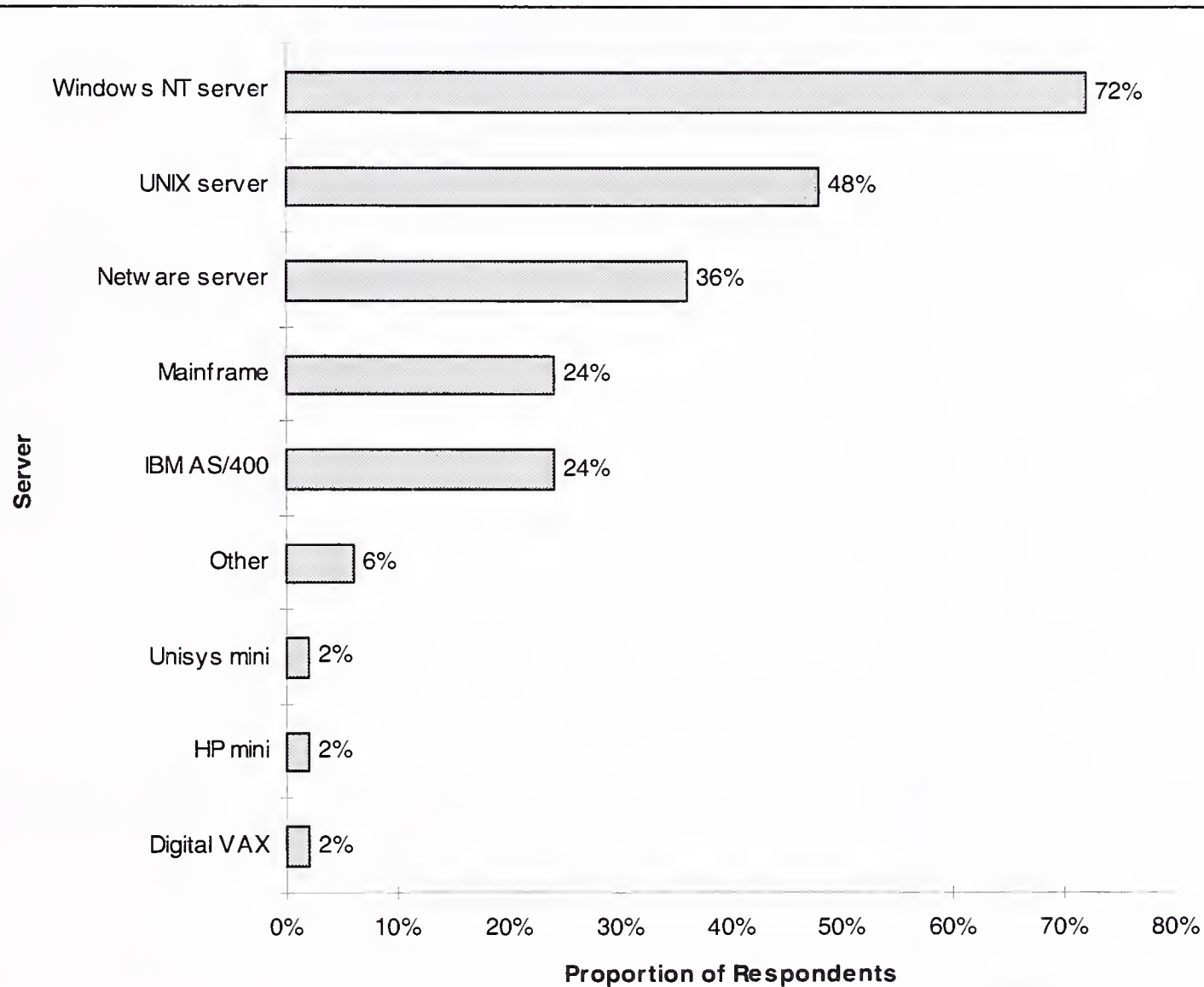
Sample: 50   Source: INPUT

3.   Databases

Exhibit III-8 shows the database platforms most commonly in current use. Access is particularly popular as a desktop/workgroup database and will increase in use further as deployment of Windows NT increases.

Exhibit III-8

Database Platforms in Current Use

Horizontal bar chart titled "Database Platforms in Current Use". Y-axis labeled "Database", X-axis labeled "Proportion of Respondents" ranging from 0% to 50%.

Database	Proportion
Access	50%
Oracle	30%
Lotus Notes	28%
Other	24%
Informix	20%
db2	12%
Progress	8%
DB/400	6%
Ingres	6%
Unidata	4%
SQL Server	4%
Uniface	2%
Powerhouse	2%
Paradox	2%
Open Road	2%
Gupta	2%
Cognos	2%
Clipper	2%
Adabas	2%
ACT	2%
Sybase	2%

Sample: 50   Source: INPUT

EI37U

4.   Networks

Exhibit III-9 shows the networks most commonly in current use.
Standard Ethernet (10Mbps) is still by far the most common architecture,
with Fast Ethernet (100Mbps) yet to achieve significant penetration.

Exhibit III-9

Network Platforms in Current Use
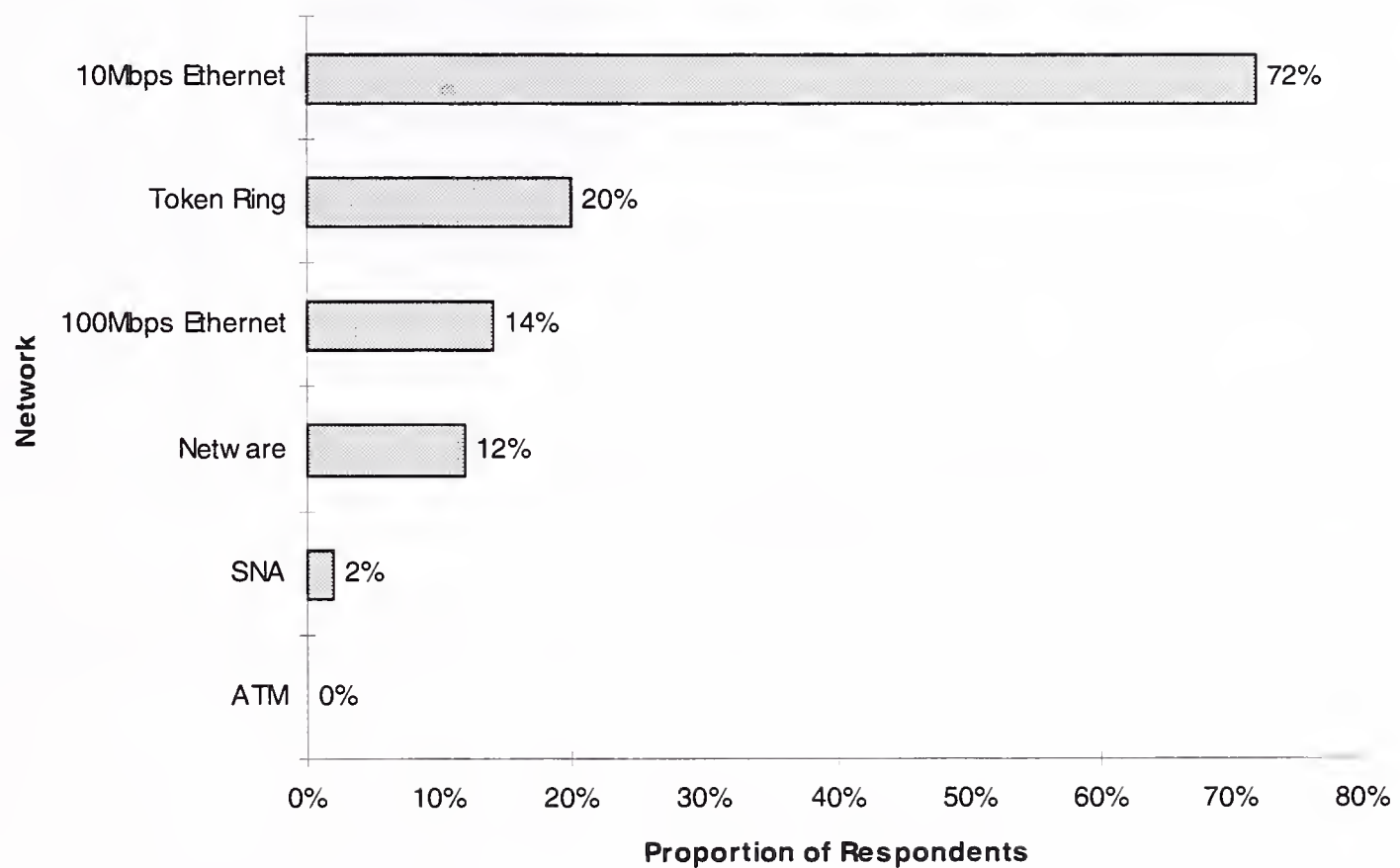
Sample: 50   Source: INPUT

5.   Intranets

Over half of large US organizations are operating or developing an Intranet (Exhibit III-10).

Exhibit III-10

Penetration of Intranets

No
42%

Yes
58%

Sample: 50   *Source: INPUT*

EI37U

IMPACT OF NCS ON SELECTION OF INTERNET/INTRANET PLATFORMS, U.S.
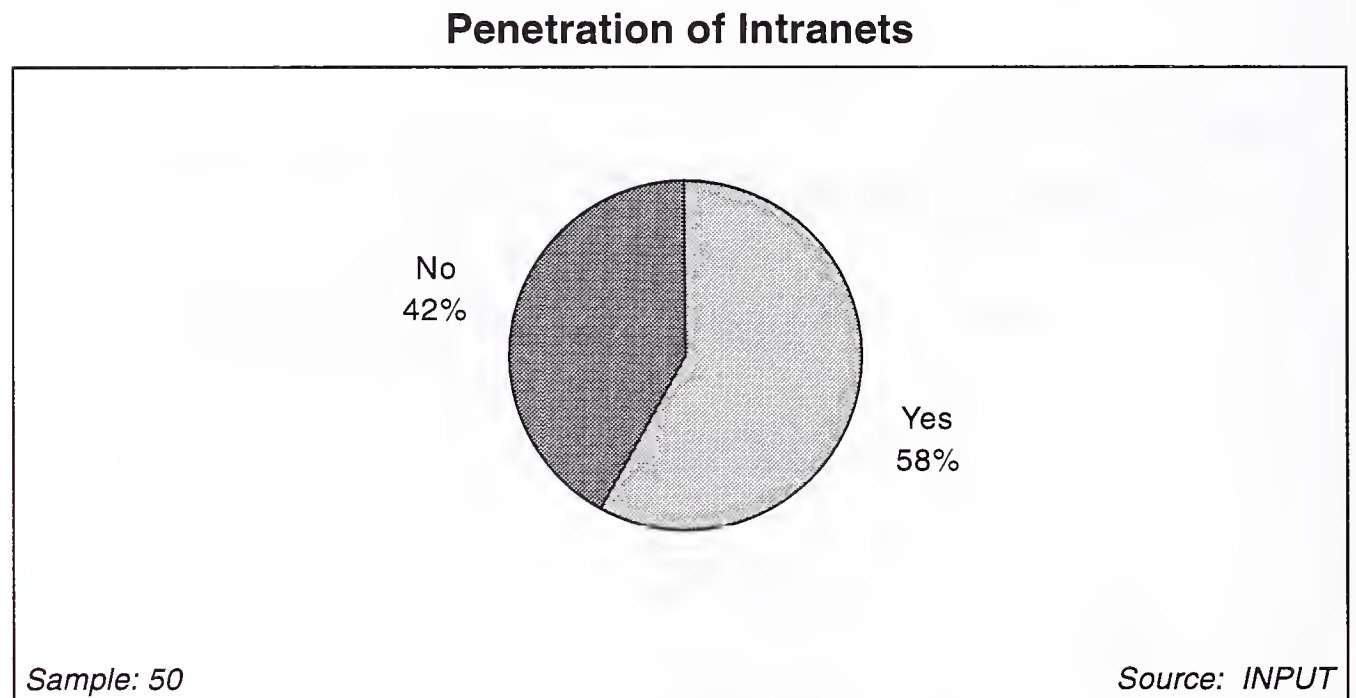
INPUT

Within those organizations, Intranets are accessible by, on average, half the user population, although accessibility varies from negligible to 100% (see Exhibit III-11).

Exhibit III-11

Intranet Accessibility
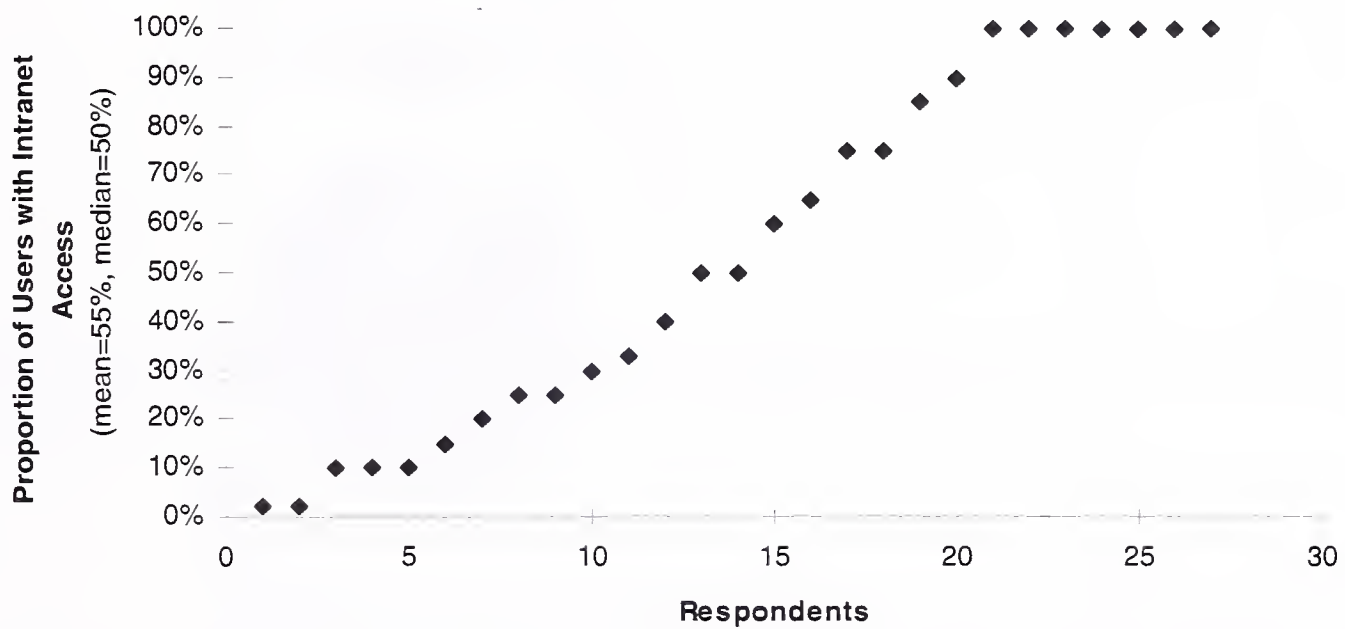
Sample: 27

Source: INPUT

6.　　Object Models

Most organizations do not have an enterprise-wide object model in place.
Just 8% use CORBA and another 8% use OLE/COM, with over 80% using
nothing currently.

Exhibit III-12

Object Models in Current Use

OLE/COM
8%

CORBA
8%

None
84%

Sample: 49　　　　　　　　　　　　　　　　　　　　　　　　　*Source: INPUT*

IV
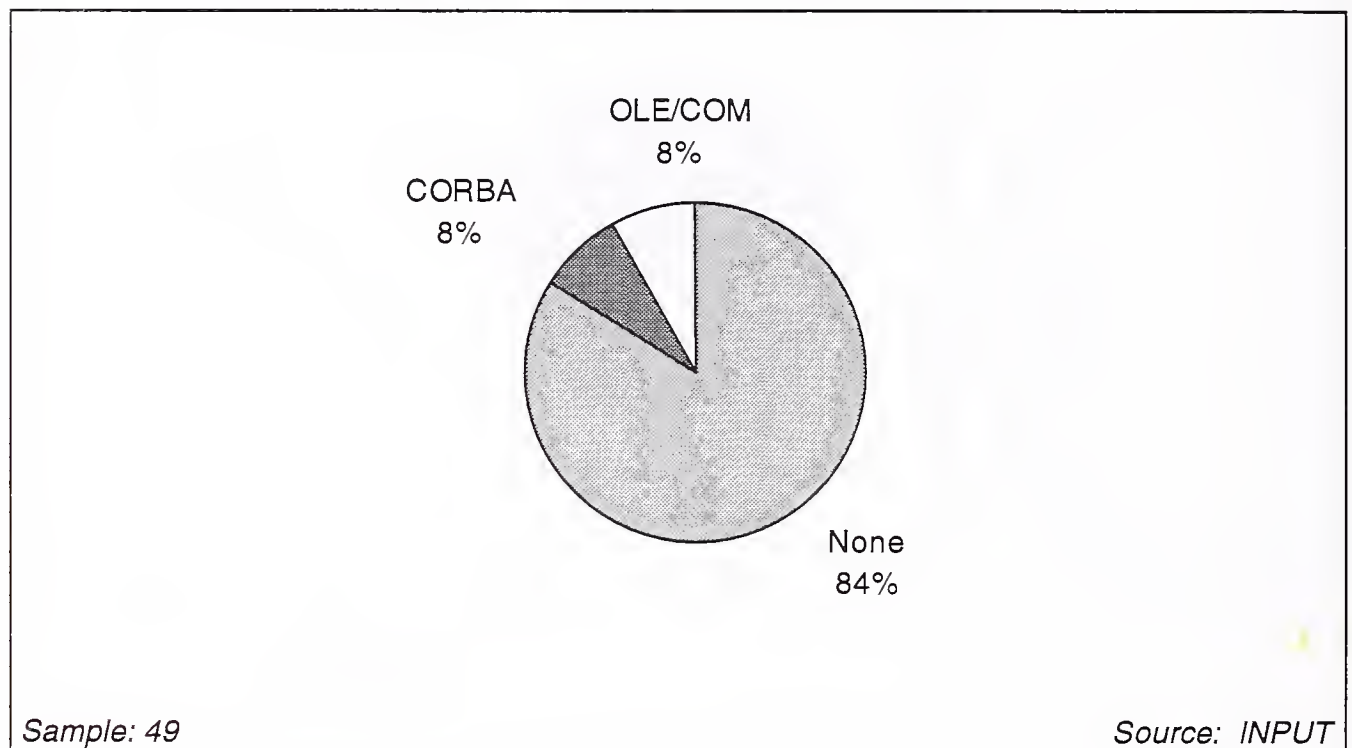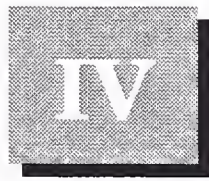
Suitability of NCs and Related Platforms for Enterprise Computing

A
Suitability of Existing Infrastructure for NC Support

1. Server Platforms

Exhibit IV-1 shows the perceived suitability of server platforms for supporting NC users. NT and UNIX are both considered highly suited to NC environments, but the other platforms in common usage are regarded emphatically as unsuitable.

Exhibit IV-1

Suitability of Server Platforms for NCs

Sample: 50   *Source: INPUT*

EI37U
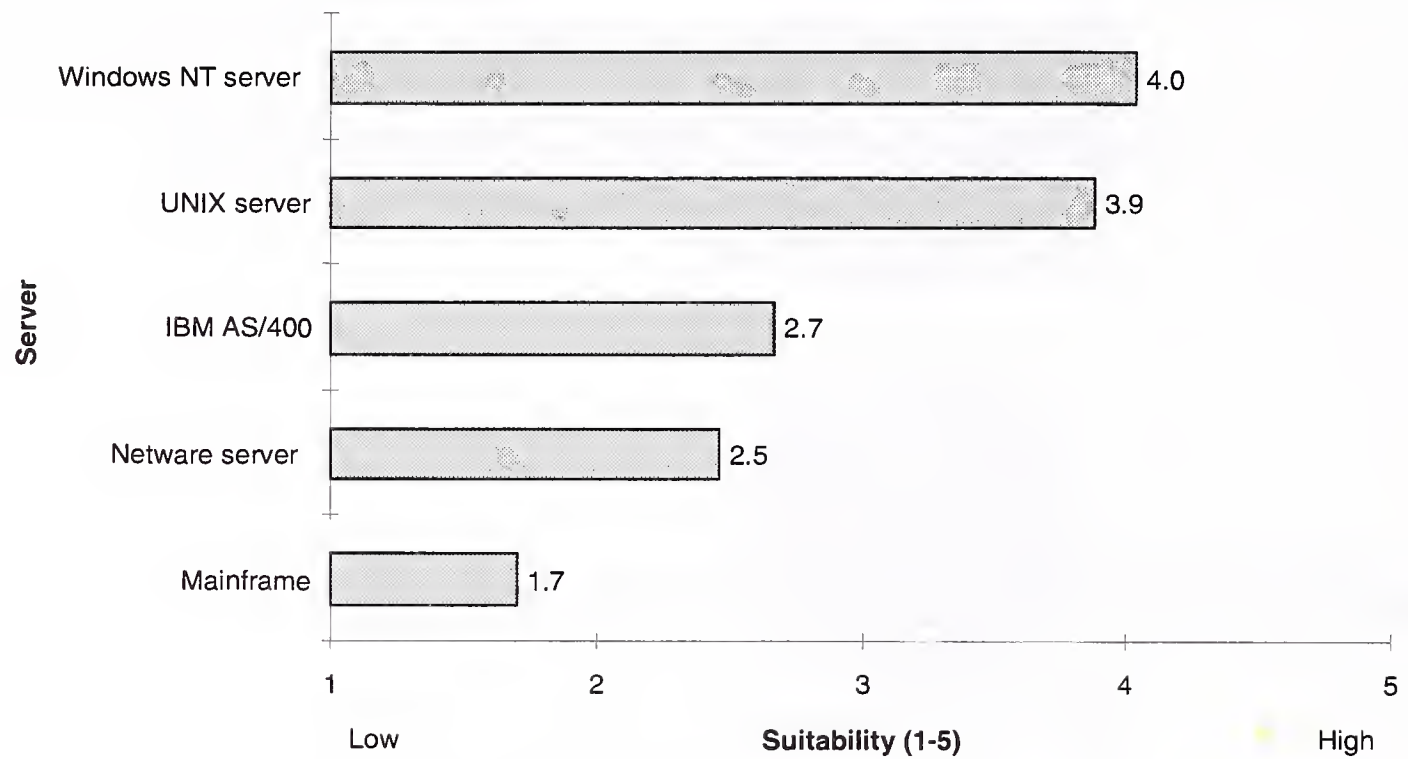
UNIX and NT received very similar responses for usage and suitability for NC support. However, when asked to select the one most suitable platform, Windows NT was the clear choice: 60% of respondents selected NT compared with 21% for UNIX, and only very small proportions for other platforms (Exhibit IV-2)

Exhibit IV-2

Most Suitable Server Platform for NCs
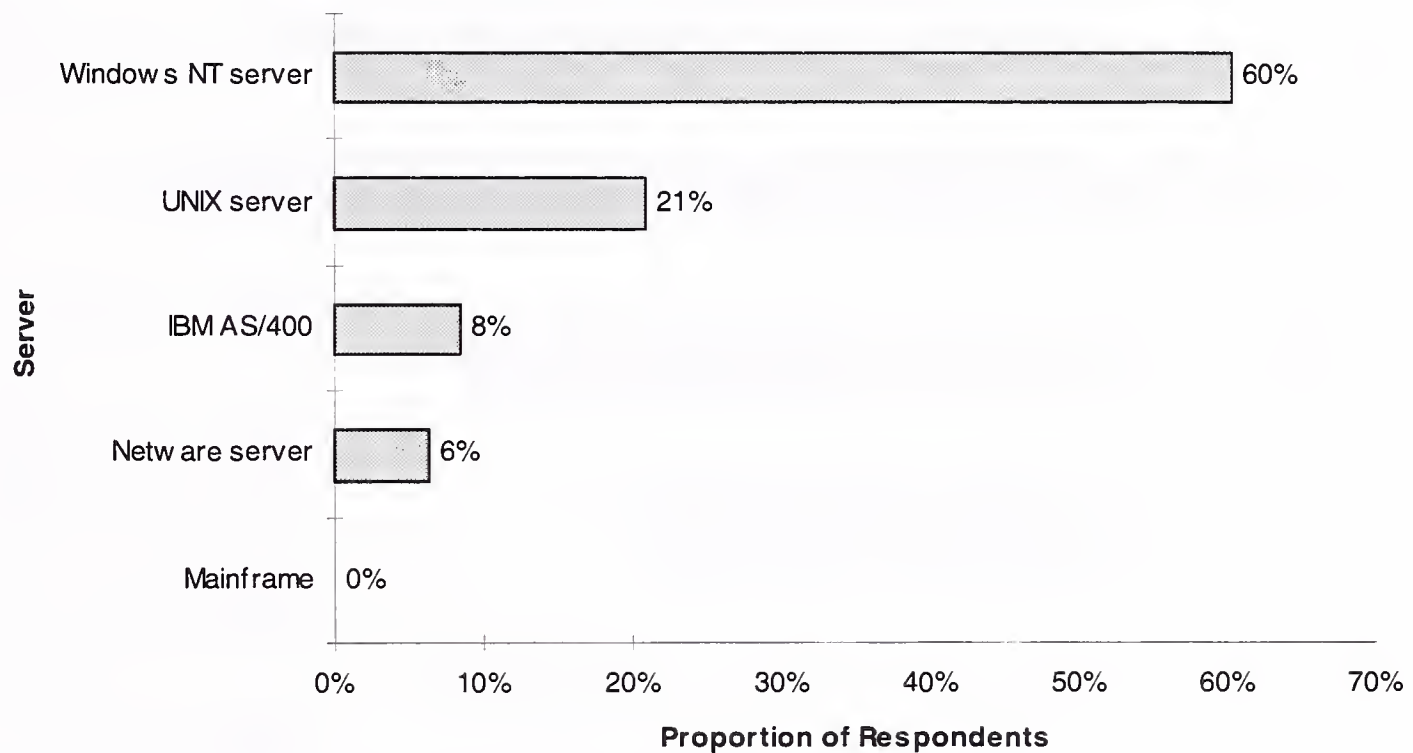
Sample: 48   Source: INPUT

2.   Database Platforms

Exhibit IV-3 shows the perceived suitability of database platforms for supporting NCs. Only Oracle can be said to be considered "very suitable", rated at 4.2 out of 5, while Access must be regarded as unsuitable. Lotus Notes, with its rich Internet/Intranet functionality is a better fit for NCs currently than Access, but still received only a mediocre rating.

Exhibit IV-3

Suitability of Database Platforms for NCs

Sample: 50   Source: INPUT
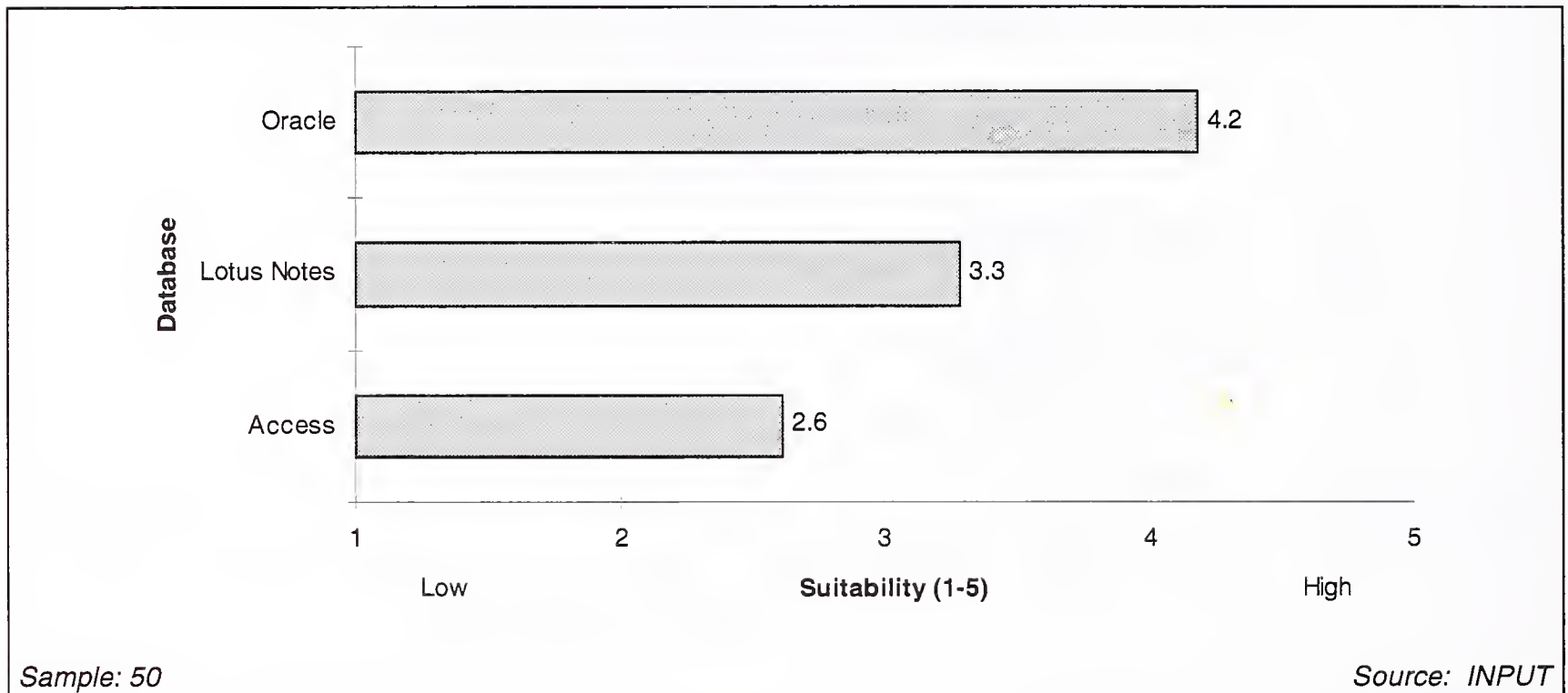
When asked to select the most suitable database, Oracle was the overwhelmingly popular choice, selected by 85% of respondents (Exhibit IV-4). Lotus Notes was chosen by only four percent of respondents, and other databases by even fewer. Access was chosen by no respondent. While Lotus Notes is considered reasonably well matched to NCs, Oracle is the clear choice of users, given the scenario of a single-database environment.

Exhibit IV-4

Most Suitable Database Platform for NCs
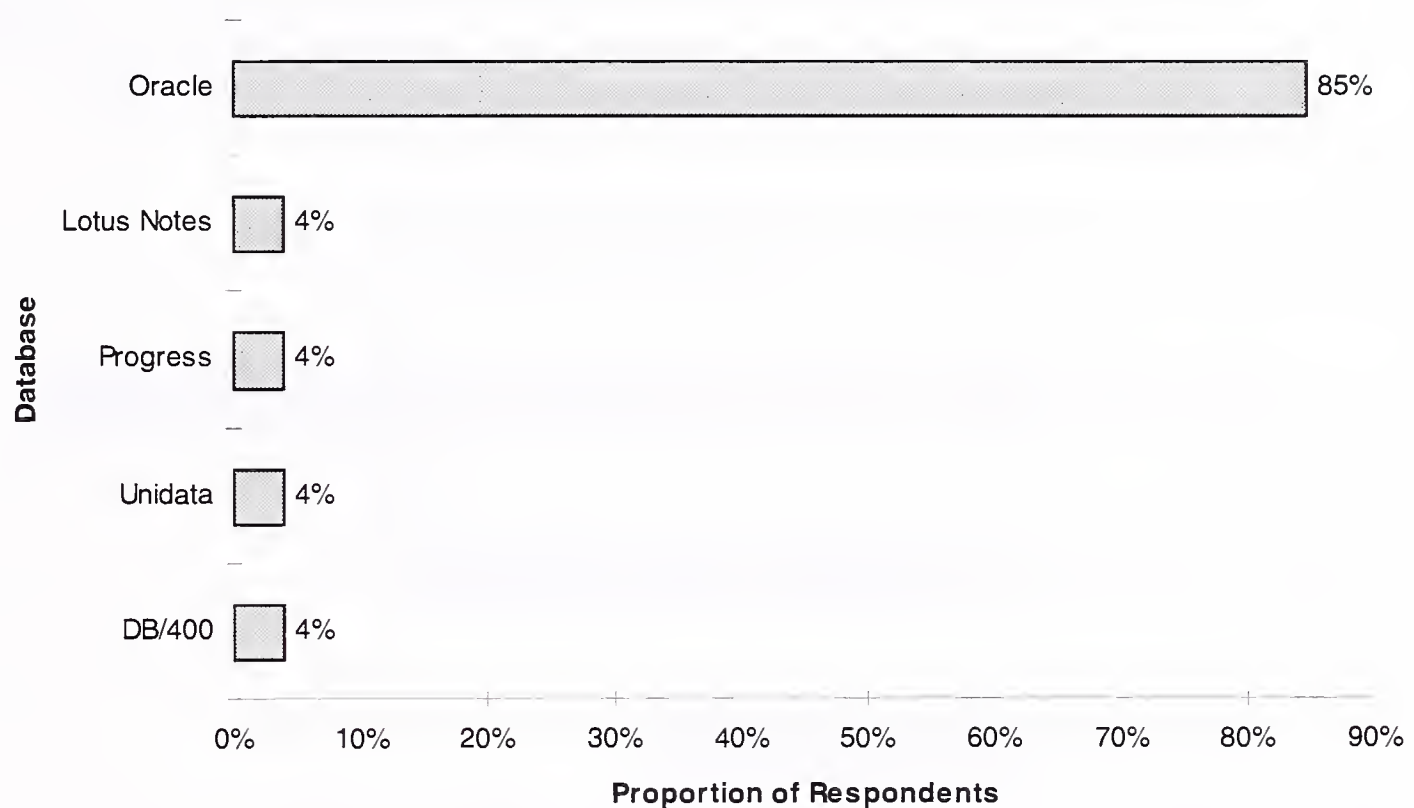
Sample: 26

Source: INPUT

3. Network Platforms

Exhibit IV-5 shows the perceived suitability of network platforms for supporting NCs. Fast Ethernet (100Mbps Ethernet) is considered to be very highly suitable, rated at 4.6 out of 5, while standard 10Mbps Ethernet, still the most widespread network architecture, is considered unsuitable.

It must be noted that the sample for each network type was small: 10Mbps Ethernet was rated by 13 respondents, Token Ring by six, and 100Mbps Ethernet by five. However, a similar result was noted in the European version of this report, in which Fast Ethernet was considered to be most suitable, well ahead of standard 10Mbps Ethernet.

Exhibit IV-5

Suitability of Network Platforms for NCs

Sample: 24   Source: INPUT
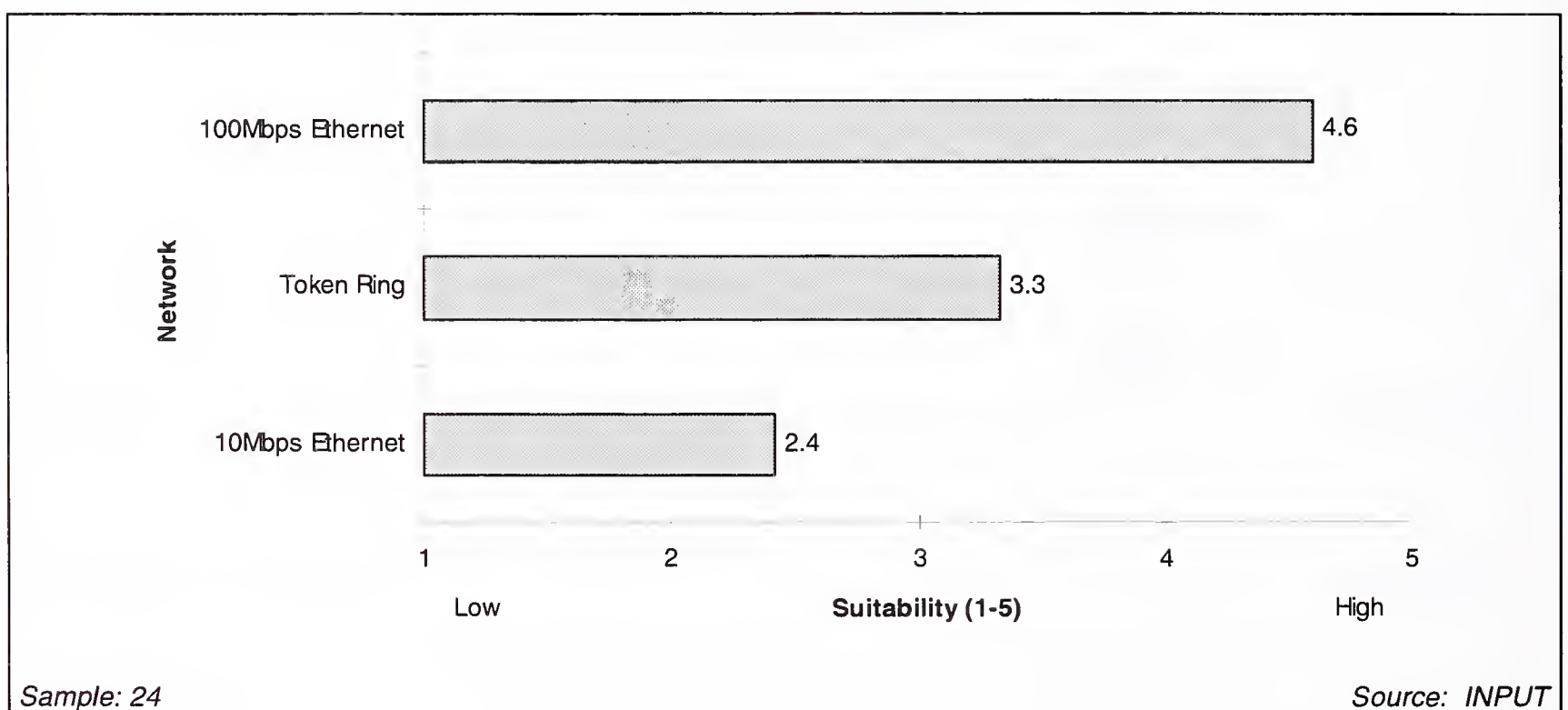
When asked to select the most suitable network for a NC environment, 100Mbps Ethernet was the favored choice, selected by around half of respondents. ATM followed, chosen by 25% (Exhibit IV-6).

The disparity between Fast Ethernet's and ATM's perceived ability to support the requirements of NC users and their current penetration indicates the need for widespread changes in network infrastructure to take place for NCs to operate on a large scale.

Exhibit IV-6

Most Suitable Network Platform for NCs
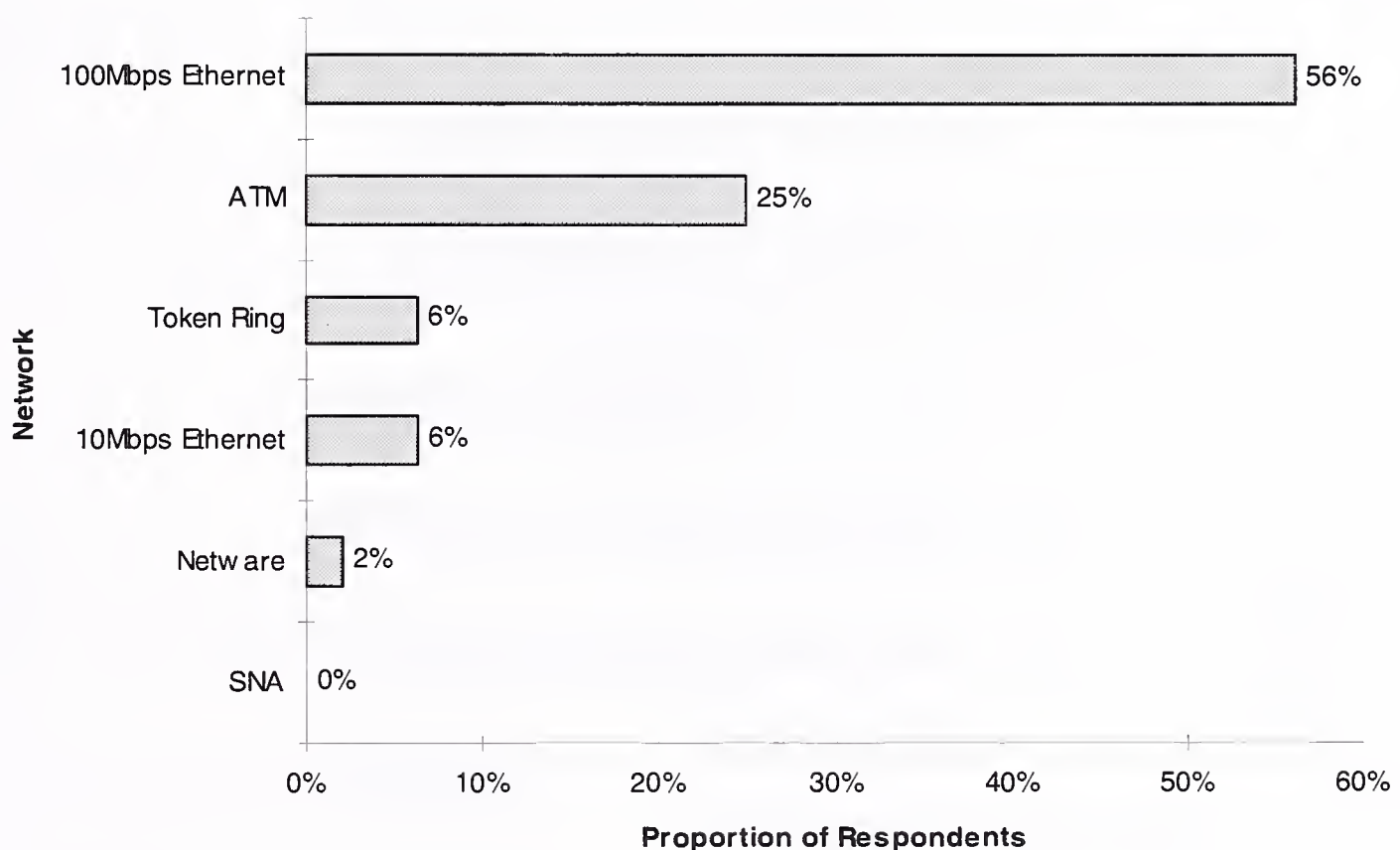
Sample: 48   Source: INPUT

B

Suitability of NCs to Department and Application

Exhibit IV-7 shows the suitability of NCs to individual departments as perceived by respondents. HR and corporate management are considered moderately suitable for NC deployment, but externally focused departments and departments typically with large populations of staff—including customer service, call center, logistics, and product development—are regarded as unsuitable for NC use.

Exhibit IV-7

Suitability of NCs by Department

Department	Suitability (1-5)
Human resources	3.2
Corporate management	3.0
Administration	2.6
Marketing	2.5
Finance	2.3
Sales	2.3
IS	2.1
Customer service	2.0
Call centre/help desk	1.8
Logistics / distribution	1.5
Product development	1.5

1 — Low   2   3 — Suitability (1-5)   4   5 — High

Sample: 26   *Source: INPUT*

EI37U
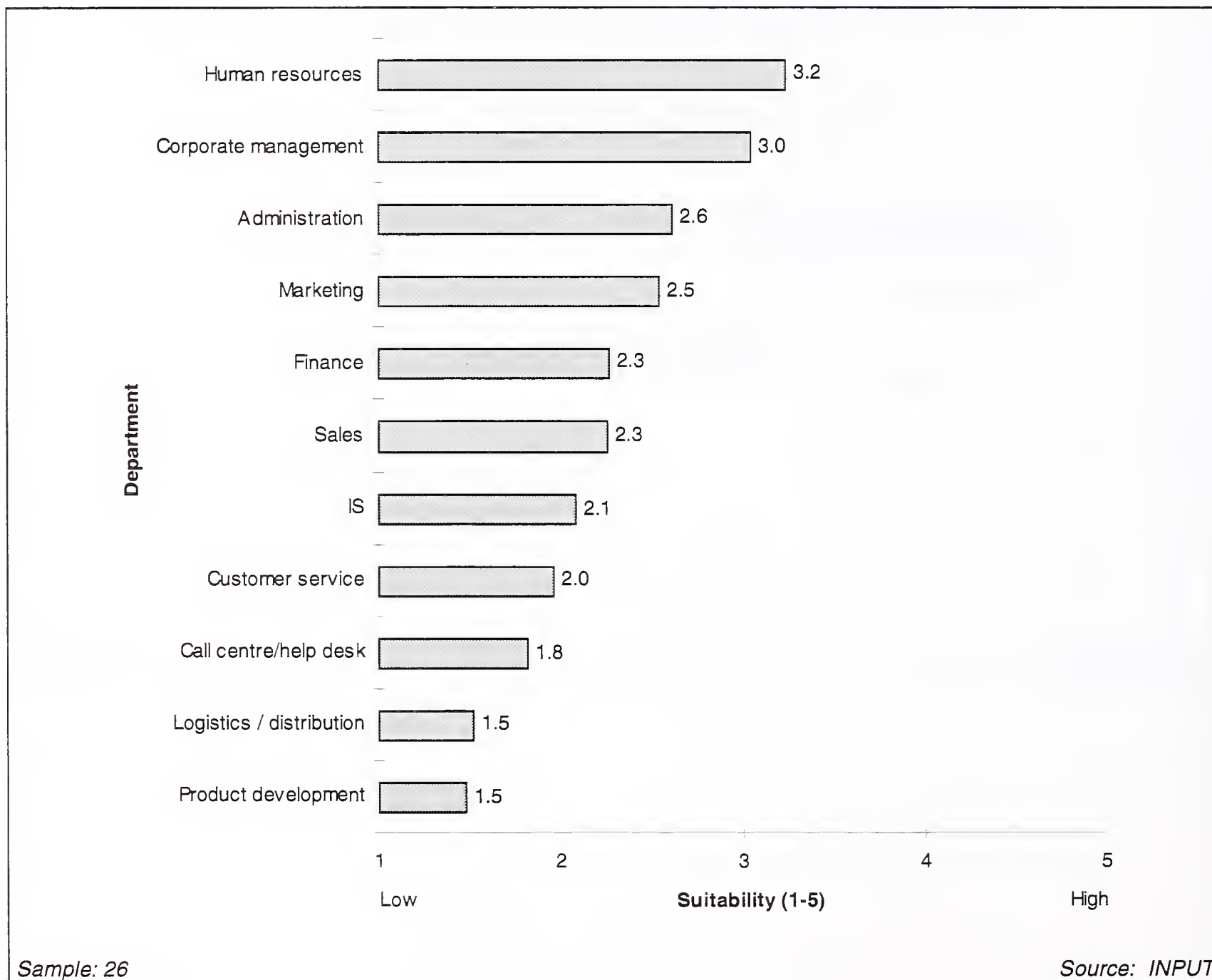
Collaborative applications (primarily messaging and groupware) are considered highly suitable for NCs. Unlike the other applications listed (with the exception of ERP), collaborative applications are inherently network-centric, to the extent that their operation relies totally on an underlying network infrastructure. It is no surprise, therefore, to find their suitability for NCs to be perceived as significantly above average.

NCs' suitability for finance applications, the next most suitable application type, echoes respondents' views on NCs' low suitability for finance departments.

Exhibit IV-8

Suitability of NCs by Application

Sample: 30

Source: INPUT
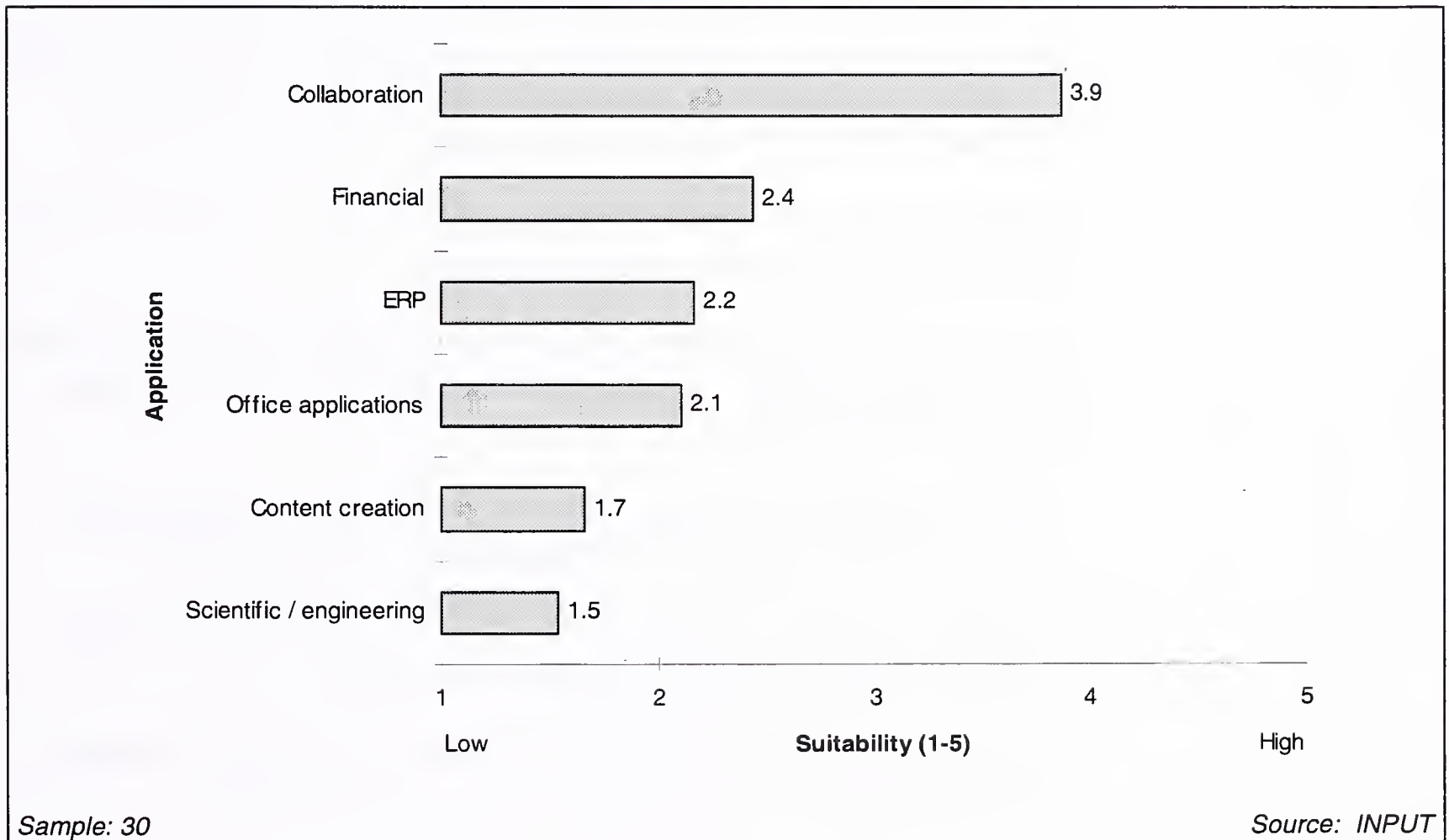
C

Suitability of NC Architecture

INPUT defines three types of NC:

- Java terminal

- Hybrid terminal

- Windows terminal

Exhibit IV-9 shows the proportions of respondents that considered each of these three types of NC above to be most suitable to their existing environments.

The proportions of users stating each NC type are broadly similar to the existing breakdown of client platforms. Twelve percent of client platforms across the sample organizations run UNIX, and 18% of respondents considered Java terminals best suited to their existing environment.

Similarly, 21% of clients are mainframe/X terminals, and 16% of users regarded hybrid terminals as most suitable.

While most NCs are not specialized for a particular environment, INPUT attributes this correlation to the likelihood that NCs will be deployed along architectural lines:

- Java terminals will tend to be placed in UNIX (particularly Sun) environments, despite Java's ability to run on most platforms.

- Hybrid terminals will tend to be placed in environments of mixed servers (mainframe, mini, Windows and UNIX).

- Windows terminals, as expected, will tend to be placed in Windows environments.

Exhibit IV-9

Best Suited NC Type for Current IT Environments

Sample: 50
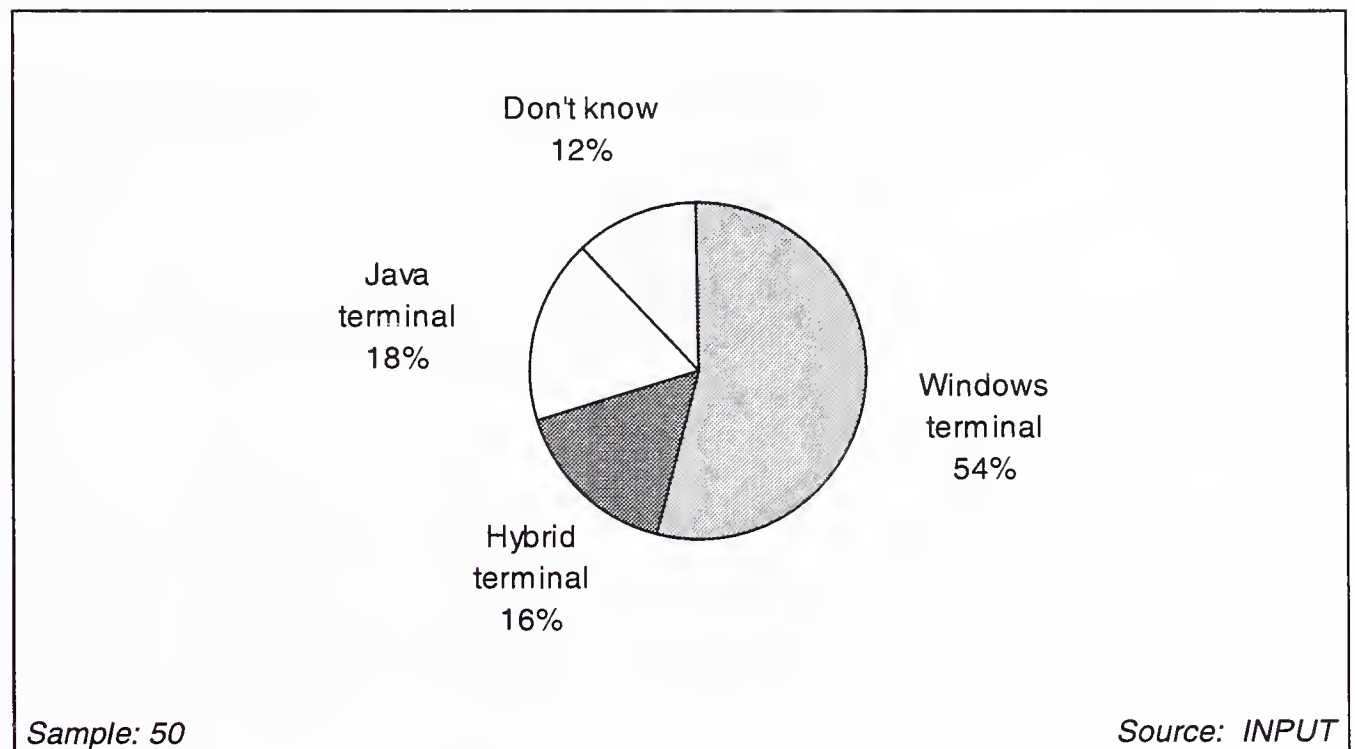
D

Suitability of Java for Enterprise Use

A critical issue for several NC vendors, particularly Sun, is the viability of Java for enterprise-wide use. Of the three types of NC—Java terminal, hybrid terminal, and Windows terminal—the success of Java terminals such as Sun's JavaStation depends largely on the ability of organizations to deploy Java applets and applications that meet requirements of performance, security, and functionality. To date, Java has not met all of these requirements.

As a result, users do not currently consider Java to be suitable for enterprise use. Exhibit IV-10 shows how suitable respondents consider the Java programming language to be. Exhibit IV-11 shows the individual 1-5 ratings given. While most users rated the suitability of Java as a programming language as 3 or lower for mid-1997, three-quarters gave it a rating of 4 or 5 for its expected suitability by mid-1999.

Exhibit IV-10

Suitability of Java as Programming Language for Enterprise Use

Sample: 38   Source: *INPUT*
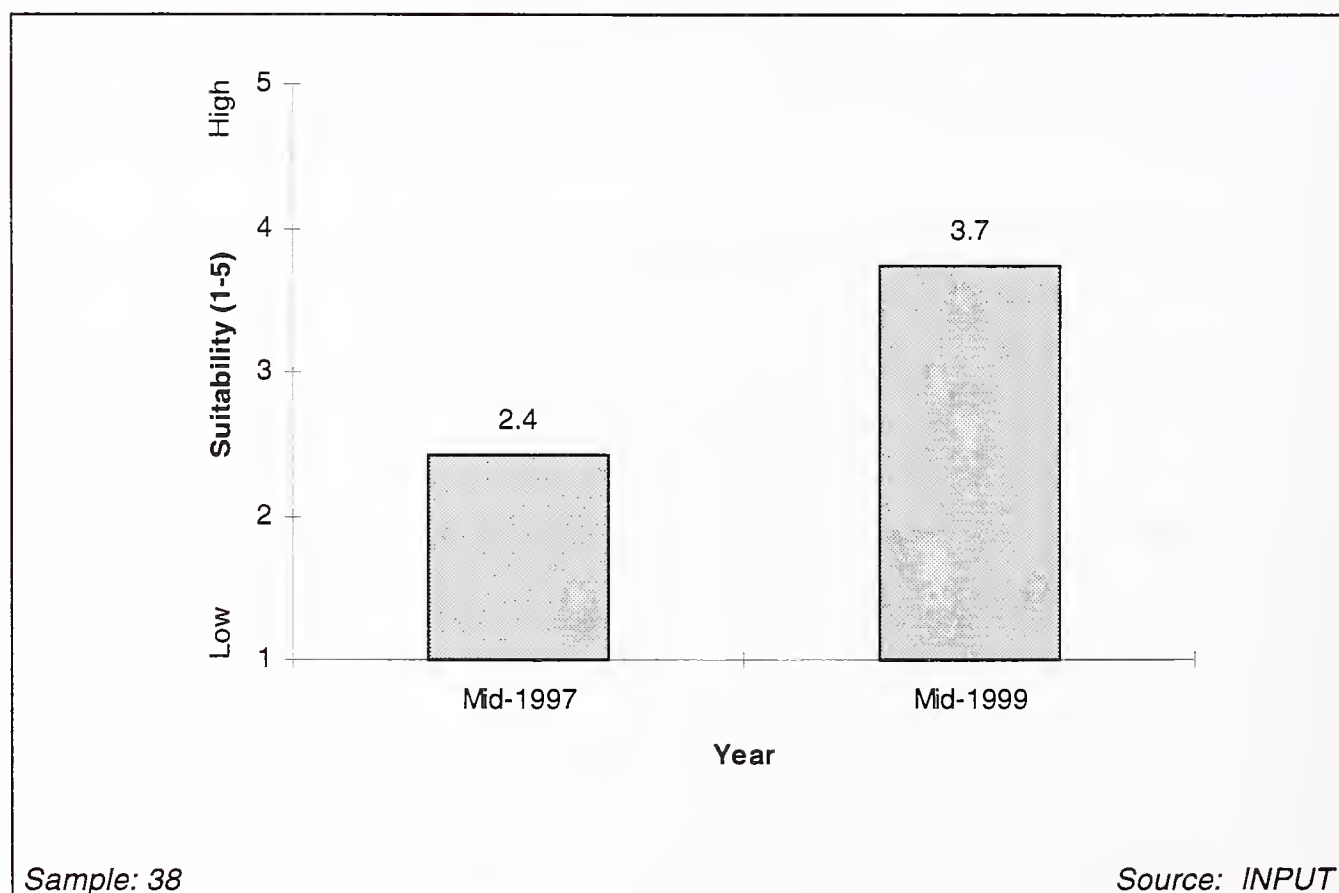
Exhibit IV-11

Suitability of Java as Programming Language for Enterprise Use, by Rating

Proportion of Respondents

45% — 45%
40% —
35% — 34%
30% —
29%
26%
25% —
20% —
20%
13%
15% —
11%
8%
10% —
9%
5% —
5%

☐ Mid-1997
▧ Mid-1999

0% —
1　　2　　3　　4　　5
Low　　　　Suitability (1-5)　　　　High
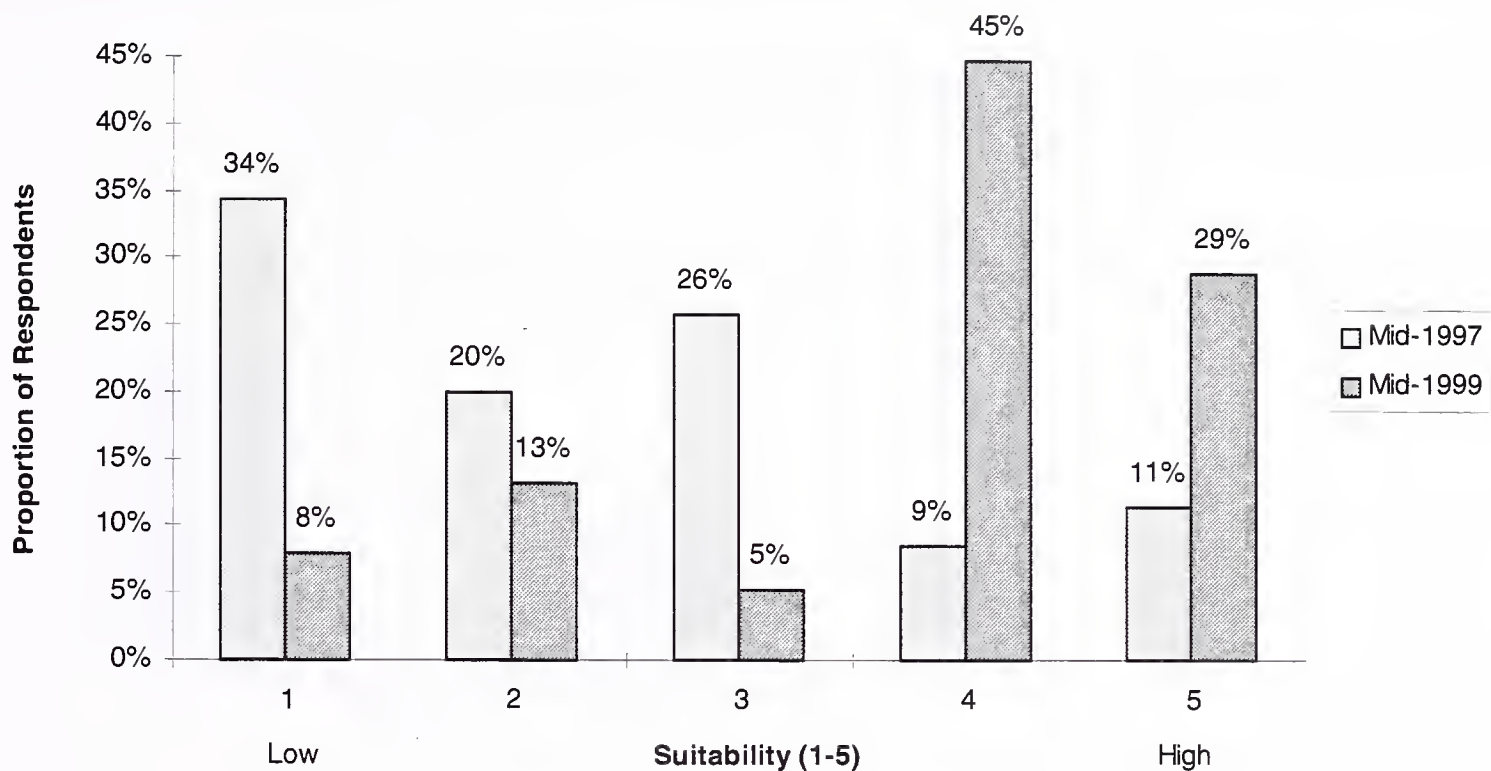
Sample: 38　　　　　　　　　　　　　　　　　　　　　　　　　　　　*Source: INPUT*

Exhibit IV-12 shows how suitable respondents consider the Java Virtual Machine (JVM) environment to be. (A JVM is the "sandbox" on a host machine that provides the environment in which Java code is executed.) Exhibit IV-13 shows the individual 1-5 ratings given.

Similarly to Java as programming language, users expect the JVM platform to become more suitable for enterprise-wide use by mid-1999. Although respondents overall do not expect the JVM to be suitable to any high degree by that time, attaining a average rating of only 2.9, a third rated its expected suitability at 4 or 5 out of 5.

Java environments, including the JVM, will certainly gain higher performance and increased stability and robustness. INPUT also expects JVMs to become more relaxed in terms of their restrictions on native communication with the underlying operating system. This will increase functionality and performance at the expense of Java application portability, but this will be perceived as a necessary tradeoff.

Exhibit IV-12

Suitability of JVM as Environment for Enterprise Use

Sample: 26   Source: INPUT
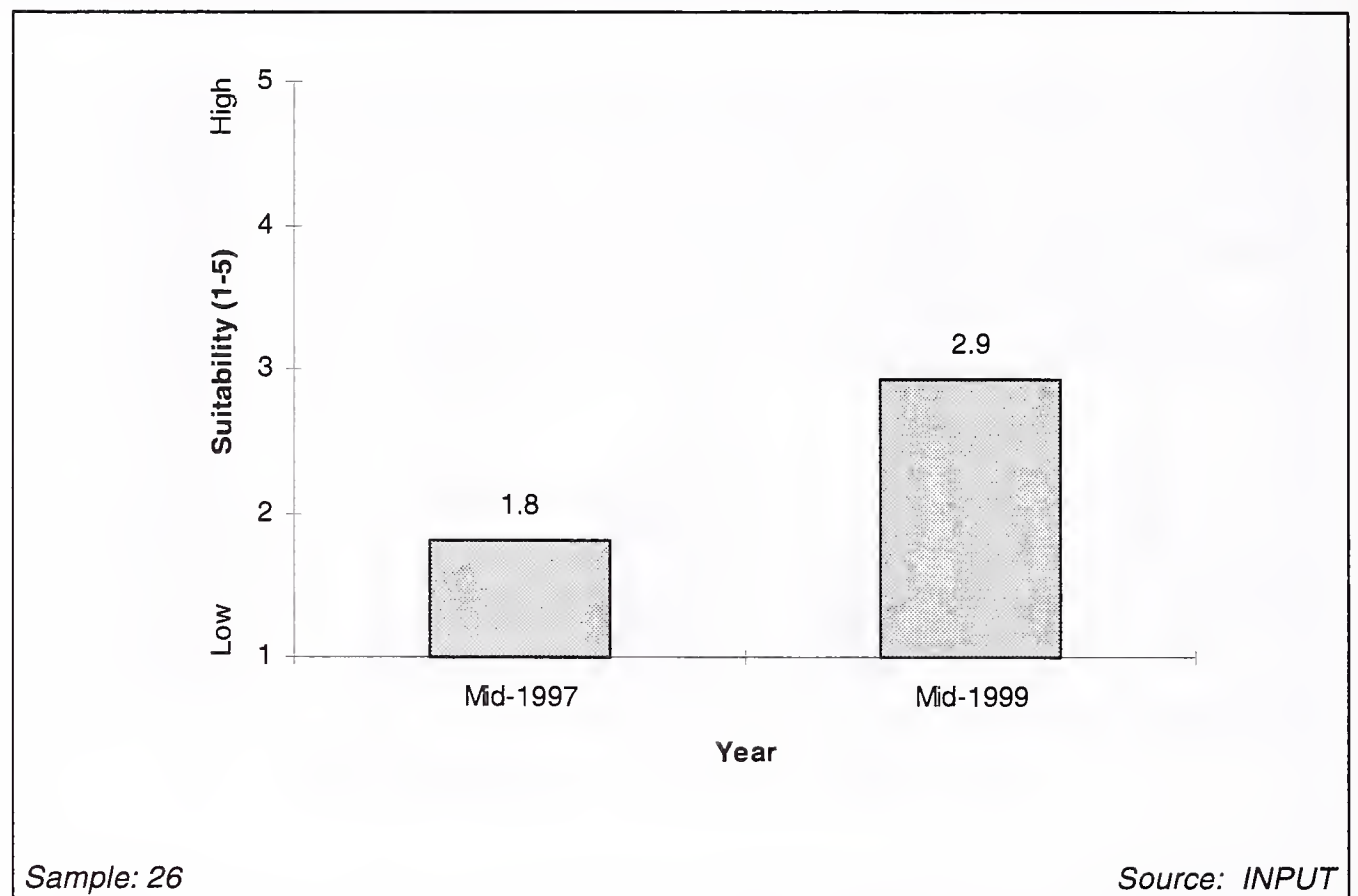
Exhibit IV-13

Suitability of JVM as Environment for Enterprise Use, by Rating

Sample: 26   Source: INPUT
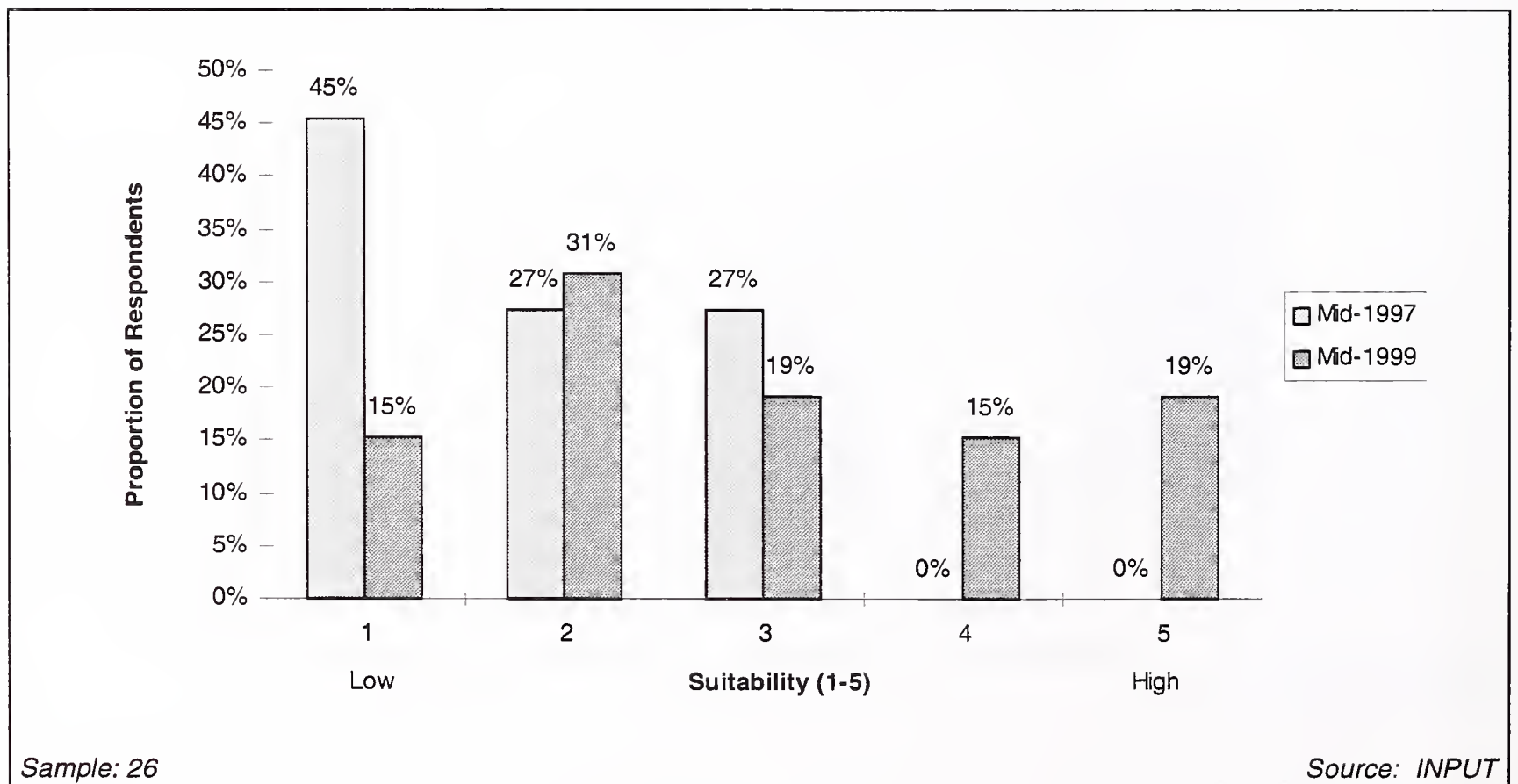
E

Client Characteristics

Exhibit IV-14 shows the importance respondents attached to several characteristics of client platforms (not specifically PCs or NCs, but all client platforms).

Characteristics marked with "(*)" are those, which INPUT identifies as fundamental strengths of NCs:

- Security.

- Support cost.

- Network configurability.

- Centralized system management.

- Centralized application and data management.

- Terminal support.

For example, NCs are strong in centralized application and data management, due to the design principle underlying them—their lack of local storage necessitates a centralized approach to software and data, as opposed to a localized client, such as a PC, which typically relies on local storage.

Purchase cost is not included in the list of NC strengths. Much attention has been paid to the supposedly lower purchase price of NCs, but INPUT does not consider this an overwhelming strength. The $500 price tag frequently referred to in the early days of NCs has yet to be realized; in addition, purchase cost is a relatively small proportion of total cost of ownership.

Ease of use, too, is not identified as a fundamental strength of NCs. While their lack of end-user configurability removes much of the complexity of PCs, and therefore enhances their ease of use, most user interaction is with application software, the quality of which is variable and not inherent to the NC itself.

As Exhibit IV-14 shows, NCs tend to be strong in the more important characteristics of client platforms. NCs' strengths are spread across the range of characteristics measured, but they include the two most important characteristics: security and support costs. Of the six "very important" characteristics (rated at 3.9 or higher), NCs are strong in four. Of the four characteristics considered of mediocre or low importance (those rated at 3.3 and lower), NCs are strong in two.

Exhibit IV-14

Importance of Client Platform Characteristics

Characteristic	Importance (1-5)	
Security	4.4	(*)
Support cost	4.2	(*)
Mobile working capability	4.1	
Centralised system management	4.0	(*)
Performance	4.0	
Centralised app./data management	3.9	(*)
Network configurability	3.3	(*)
Purchase cost	3.2	
Ease of use	3.0	
Terminal support	2.5	(*)

Low   **Importance (1-5)**   High

Sample: 44   *Source: INPUT*

    EI37U
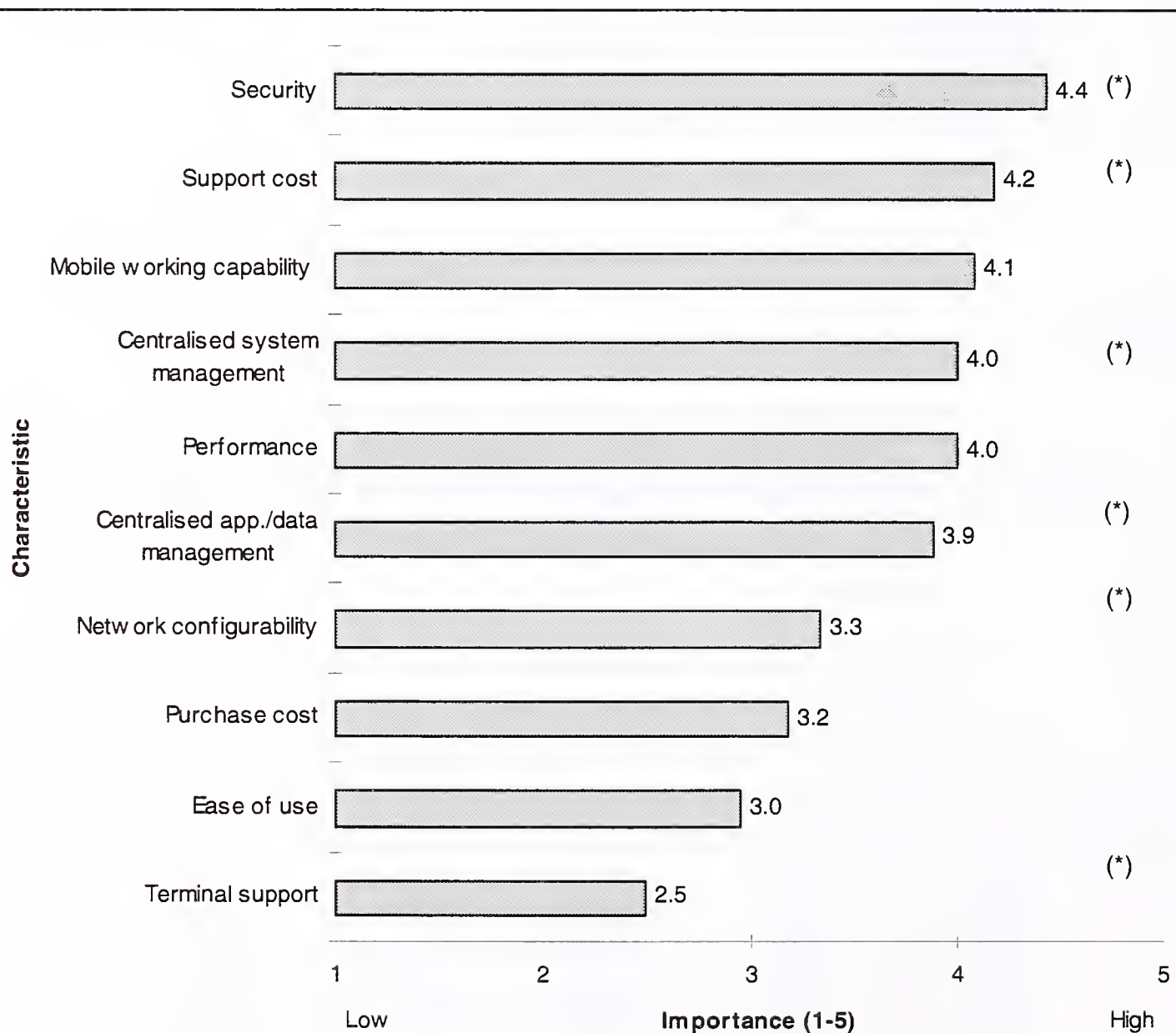
Exhibit IV-15 shows how satisfied respondents are with their PCs for the same set of characteristics. As before, characteristics marked with "(*)" are those which INPUT identifies as NC strengths.

There is a tendency for NCs to be strong in those areas where PCs are rated lowest. For example, PCs are rated poorly for centralized application and data management, at 2.6 out of 5, but NCs are strong in this area for the reasons give above.

Exhibit IV-15

Satisfaction with PC Characteristics

Characteristic	Satisfaction (1-5)	NC Strength
Ease of use	4.2	
Performance	3.9	
Purchase cost	3.7	
Security	3.4	(*)
Network configurability	3.4	(*)
Support cost	3.1	(*)
Terminal support	3.0	(*)
Mobile working capability	3.0	
Centralised system management	2.7	(*)
Centralised app./data management	2.6	(*)

Axis: 1 (Low) — 2 — 3 — 4 — 5 (High), Satisfaction (1-5)
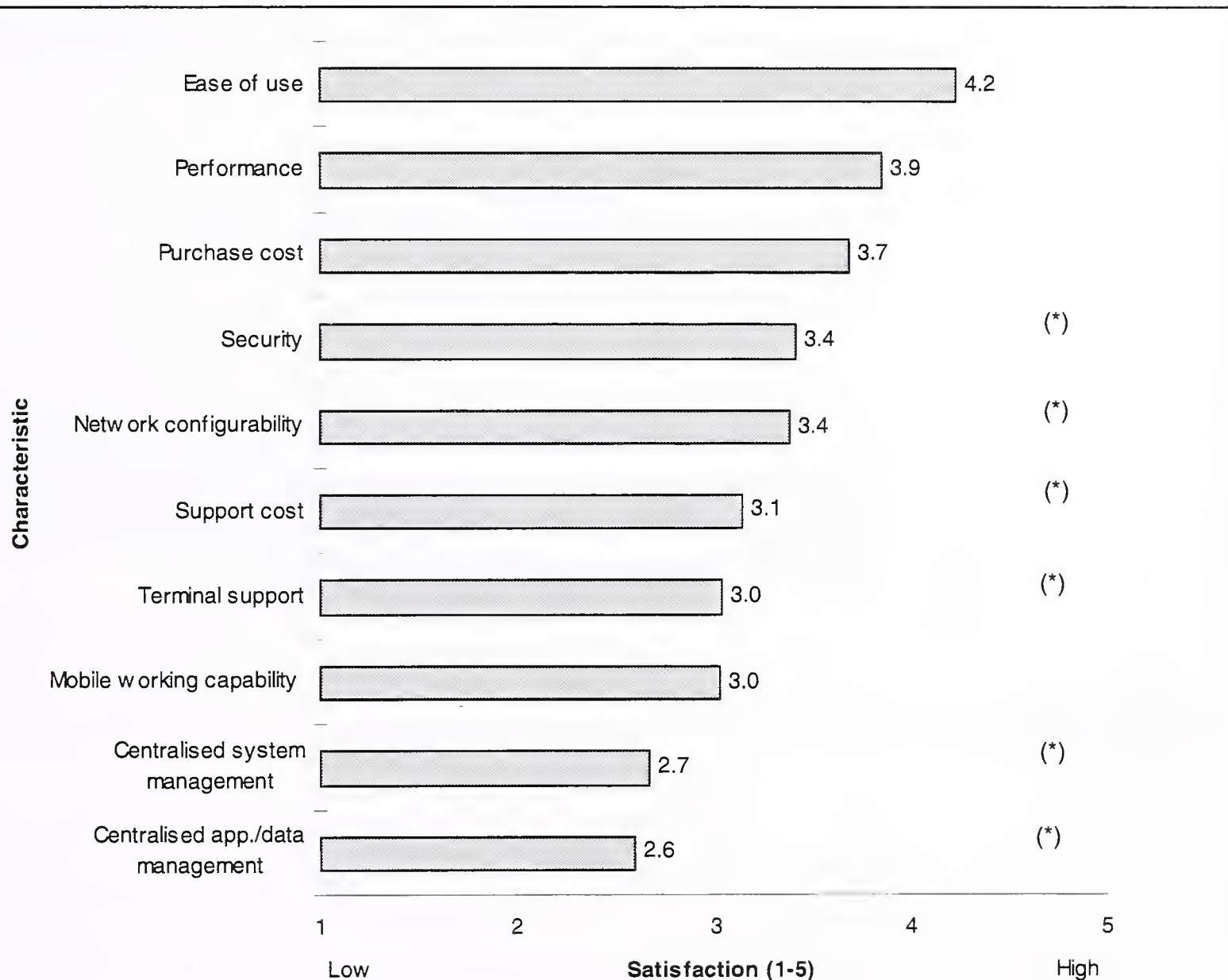
Sample: 43   Source: INPUT

To further illustrate the difference in strengths between PCs and NCs, Exhibit IV-16 shows the importance of client platform characteristics plotted against satisfaction with PCs for the same characteristics. The categories, which INPUT identifies as NC strengths, are marked with a white cross.

Items below the dotted line are rated poorly compared with the importance attached to them; items above the dotted line, conversely, are rated highly.

The only category in which PCs perform noticeably well compared with its importance (furthest above the dotted line) is ease of use.

The categories in which PCs perform worst (furthest below the dotted line) include:

- Support costs.

- Centralized application and data management.

- Centralized system management.

- Security.

As noted above, NCs are strong in most of the areas in which PCs perform poorly, and generally not strong (although not necessarily weak) in the areas in which PCs perform well. NCs have the potential, therefore, to address several current shortcomings of PCs.

Exhibit IV-16

PC Characteristics: Importance vs Satisfaction

Sample: 44   *Source: INPUT*
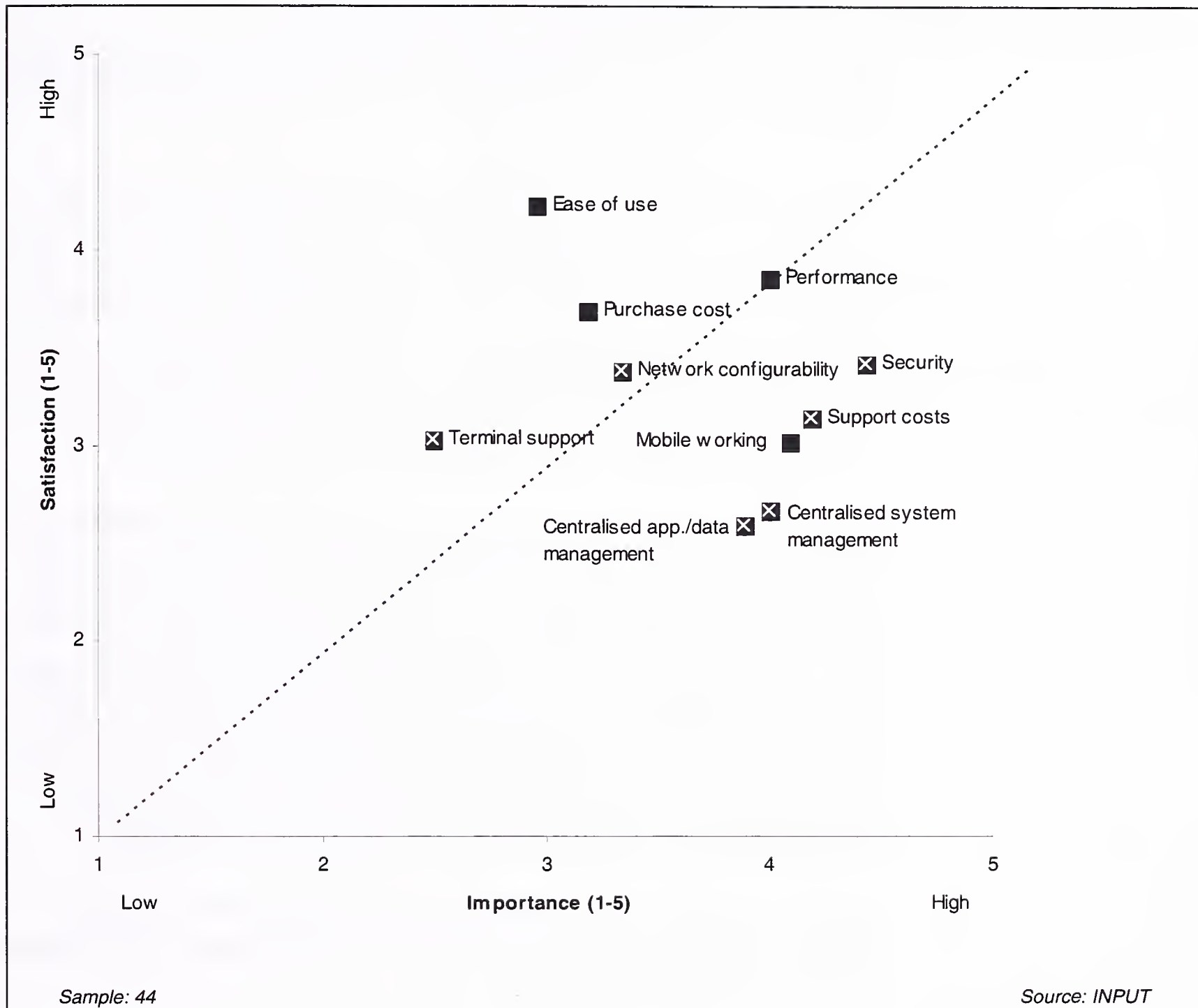
F

PC and NC Strengths and Weaknesses

Respondents were asked to describe which aspects of PCs and NCs they considered strengths and weaknesses. Exhibits IV-18 to IV-21 show the responses given for each category.

The major strengths and weaknesses are summarized in Exhibit IV-17. Users find PCs flexible and easy to use, which INPUT expects will also be considered true of NCs, particularly ease of use. Users also consider the breadth of application support to be a notable strength of PCs, and this will remain a strong differentiator of PCs over NCs for some time. While most server-based applications can be accessed by a Windows-equipped NC or Windows terminal, most applications are designed to be run in a localized environment, which is suitable for PCs but not NCs.

Although the sample of respondents who stated perceived weaknesses of NCs was small, NCs clearly suffer from being an "unknown quantity". (This issue was the most commonly reported weakness of NCs among European respondents.) NCs have to gain acceptance among users not just in technological terms, but against the backdrop of PC dominance. In order to challenge the PC, they must resolve the consistently reported shortcomings of PCs: administration overhead and cost. However, both of these problem areas are rapidly being addressed by PC hardware and software vendors, including Intel and Microsoft. As PCs adopt the beneficial features of NCs, so NCs lose much of their advantage.

INPUT maintains its view that NCs will not replace PCs, except in situations where over-functional PCs have been deployed in the absence of a viable alternative.

Exhibit IV-17

PC/NC Strengths and Weaknesses

Platform	Main Strengths	Main Weaknesses
PC	Flexibility	Administration overhead and cost
	Application support	
	Ease of use	
NC	Low administration overhead and costs	Unproven concept and technology
	Centralized environment	Lack of functionality

Source: INPUT

Exhibit IV-18

PC Strengths

Strength

Strength	Proportion of Mentions
Flexibility	19%
Application support	17%
Ease of use	15%
Localised environment	11%
Performance	11%
De facto standard	6%
Price	4%
Integrated design	4%
Familiarity	4%
User productivity	4%
Graphics/multimedia	2%
Communications abilities	2%
Multitasking	2%
Manageability	2%

Proportion of Mentions

Sample: 54   *Source: INPUT*

EI37U
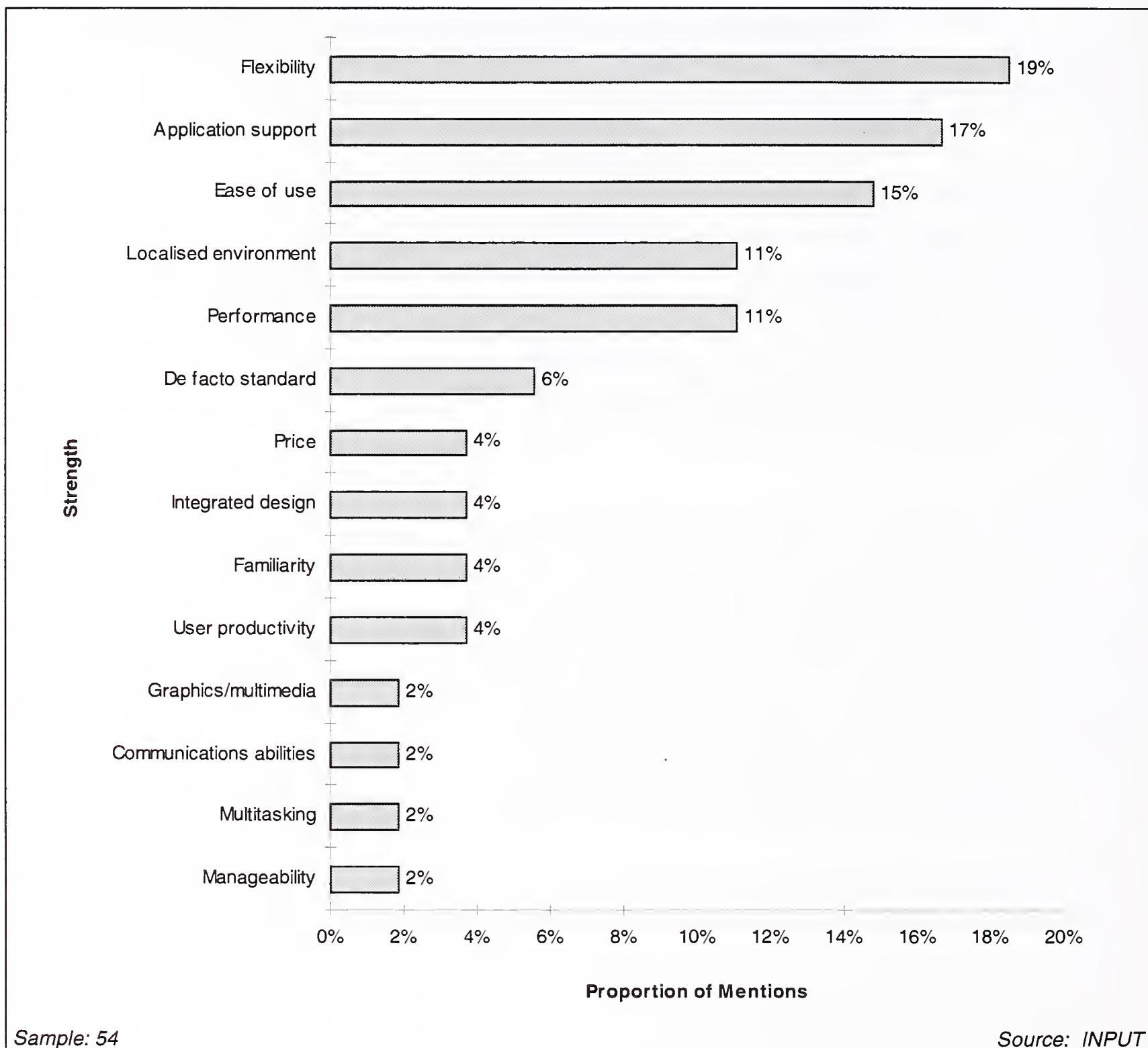
Exhibit IV-19

PC Weaknesses

Sample: 48

Source: INPUT

Exhibit IV-20

NC Strengths

Strength

Low administration overhead	32%
Centralised environment	24%
Low administration costs	21%
Ease of use	12%
Reliability	3%
User productivity	3%
Performance	3%
Standards-based	3%

0%   5%   10%   15%   20%   25%   30%   35%

Proportion of Mentions

Sample: 34

Source: INPUT

EI37U
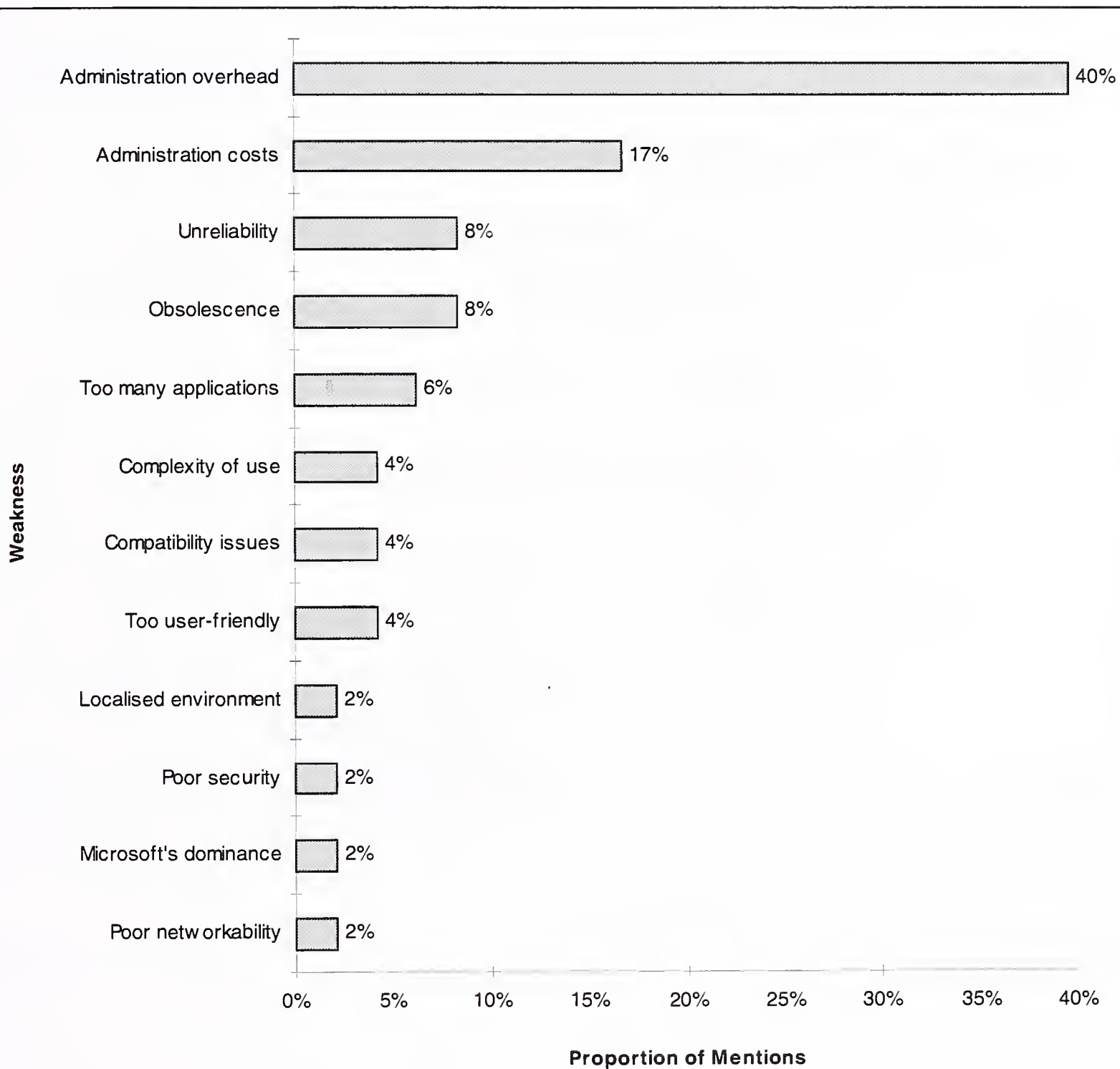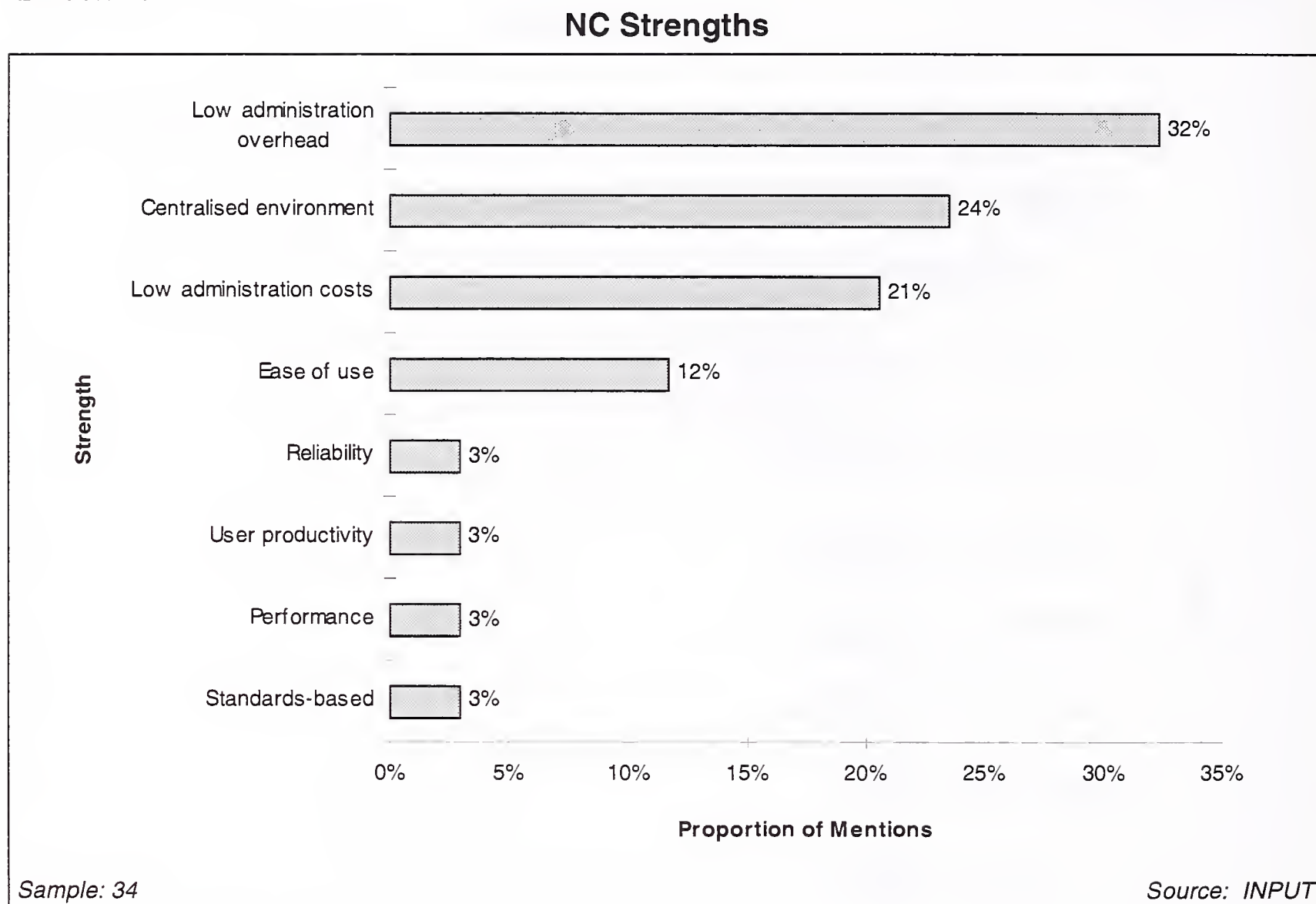
Exhibit IV-21

NC Weaknesses

Horizontal bar chart. X-axis: "Proportion of Mentions" from 0% to 18%. Y-axis: "Weakness".

Weakness	Proportion of Mentions
Lack of functionality	17%
Unproven concept	17%
Dependence on network/server	11%
Network performance requirements	11%
User resistance	11%
"Just another fad"	11%
Performance	6%
Proprietary design	6%
Lack of flexibility	6%
Obsolescence	6%
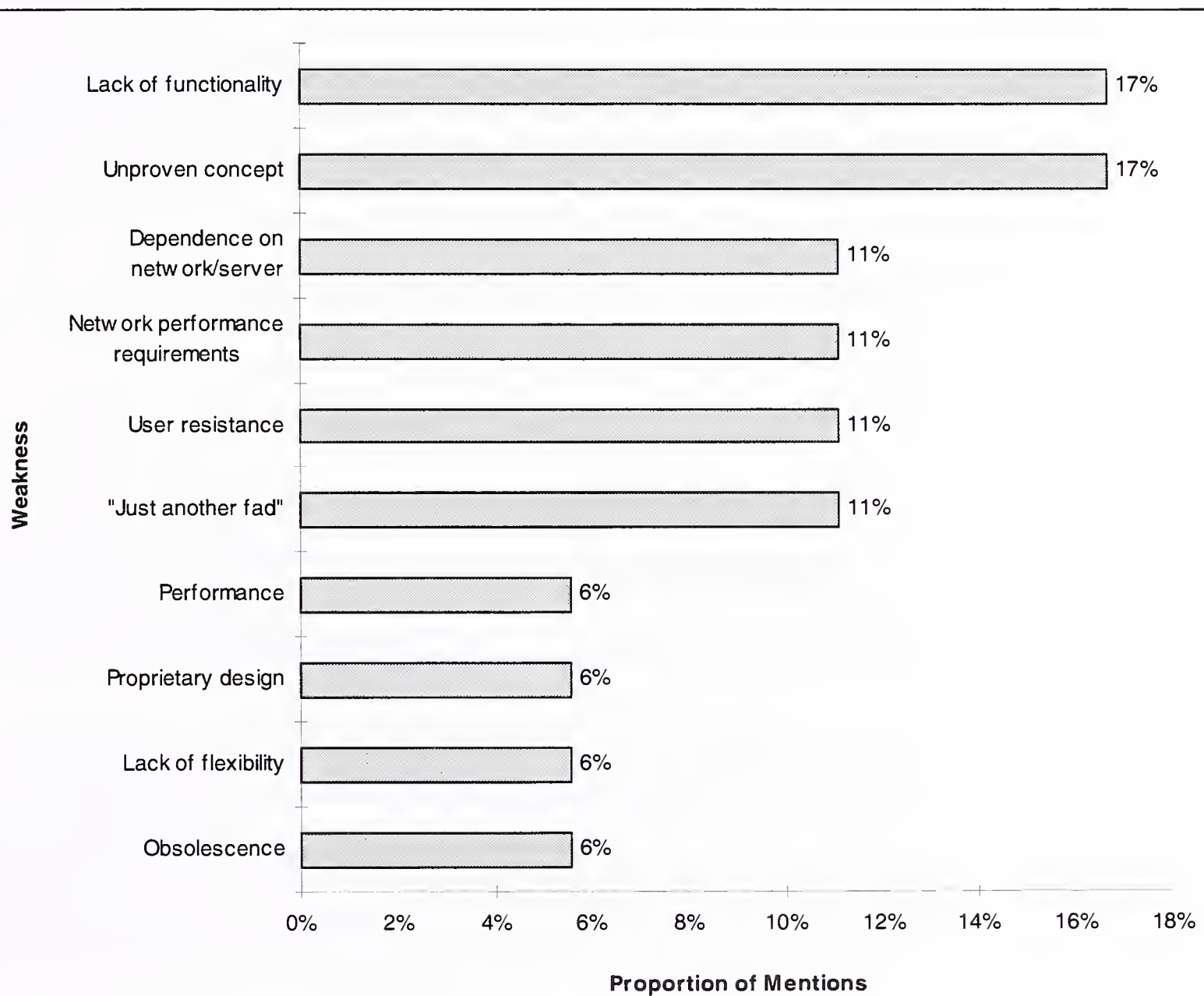
Sample: 18

G

Intranet Server Characteristics

Exhibit IV-22 shows the importance that respondents attached to characteristics of an Intranet server. The characteristics considered most important are not of direct relevance to thin client computing. Those rated at 4.0 or higher were:

- Performance.

- Availability.

- Security

- Centralized management.

These characteristics are applicable to all types of server—file, print, application, and network—which indicates that users are concerned less with their client requirements than they are with ensuring a stable server platform.

The characteristics of particular relevance to thin client computing—server-side Java, multi-client Windows support, and NC support—are considered to be less important to an Intranet server. NC support, rated at 3.1 out of 5, is not considered highly important overall. Although most respondents within the sample do not yet use NCs, the low rating given to NC support suggests that NCs are not a high priority for many users.

Exhibit IV-22

Importance of Intranet Server Characteristics

Characteristic	Importance
Performance	4.4
Security	4.3
Availability	4.3
Centralised management	4.2
Scalability	3.9
Support cost	3.8
Multi-client Windows support	3.6
Purchase cost	3.4
Server-side Java	3.2
NC support	3.1
CORBA	2.7
OLE/COM	2.4

Low   Importance (1-5)   High
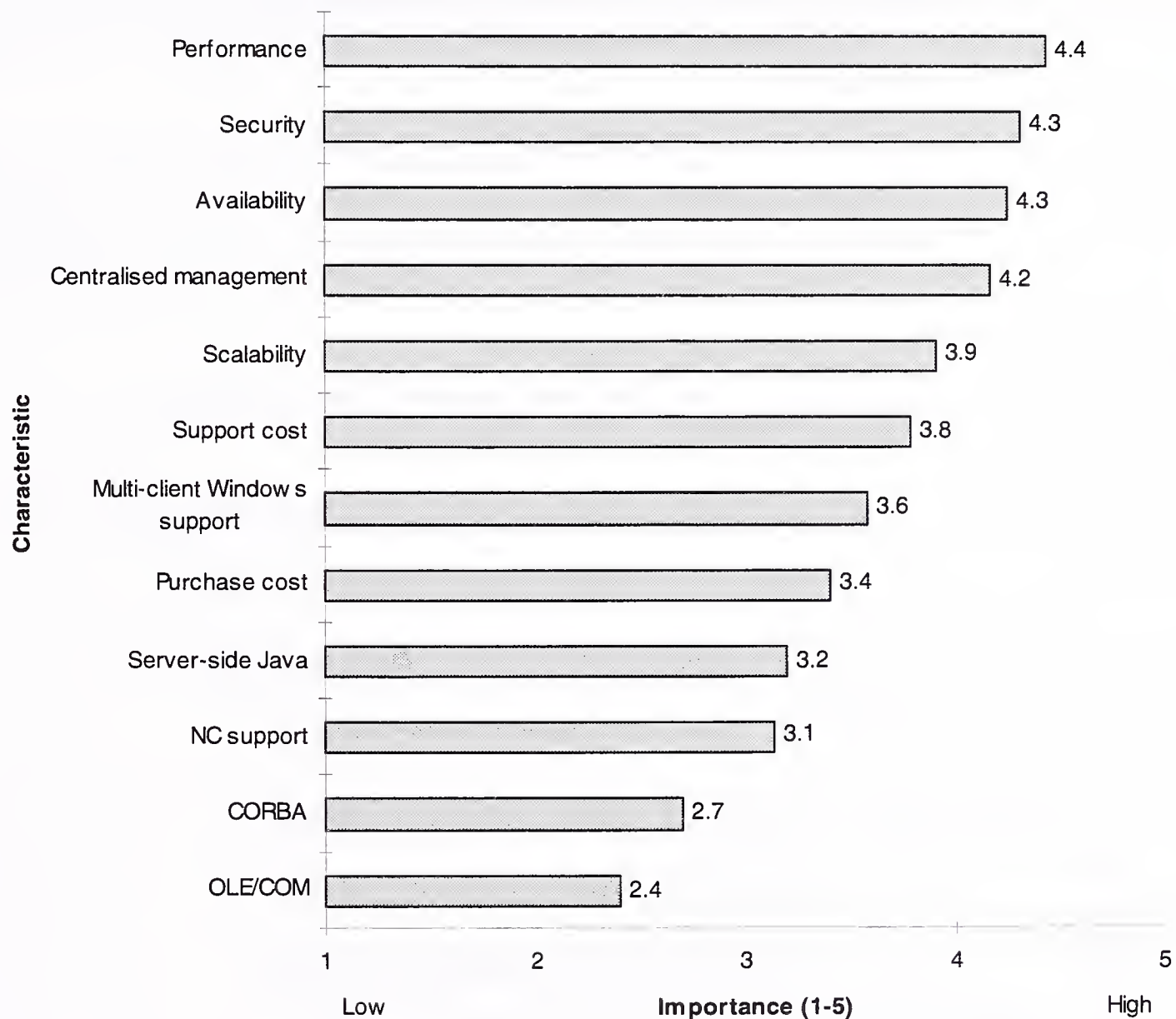
Sample: 48   *Source: INPUT*

Exhibit IV-23 shows how satisfied users who currently have an Intranet are with the same set of Intranet server characteristics. Users are satisfied with the most important characteristics—performance, availability, and security—although slightly less so with centralized management.

Users are dissatisfied with their Intranet servers' support for objects—CORBA and COM. Most users, around 85%, have not yet implemented an enterprise-wide object model, although a very small minority expect still not to have implemented such a model in two years (by mid-1999).

Exhibit IV-23

Satisfaction with Intranet Server Characteristics
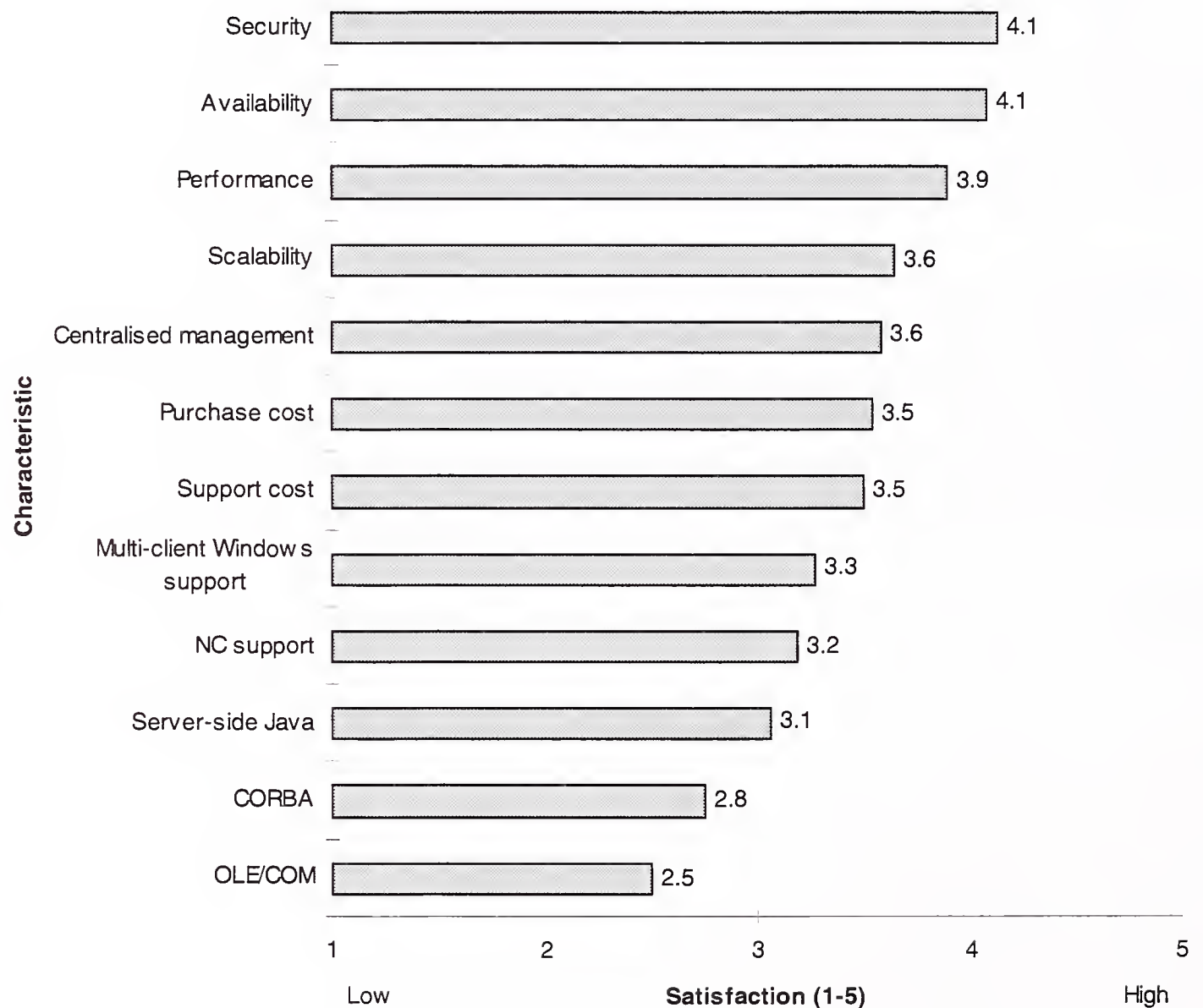
Sample: 28   Source: INPUT

Exhibit IV-24

Intranet Server Characteristics in Need of Improvement

Characteristic	Importance	Satisfaction	Difference
Centralized management	4.2	3.6	-0.6
Performance	4.4	3.9	-0.5

Source: INPUT

EI37U   **63**

64

V
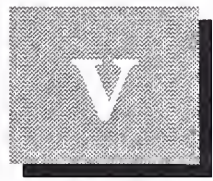
Future NC and Related Platform Usage and Requirements

A

Future NC Usage

1. Expected NC Use by Mid-1998

As presented earlier in this report, the state of current and expected NC usage as of mid-1997 was as follows:

- Currently considering—34%

- Currently using in a pilot scheme—8%

- Currently using for live applications—2%

There appears to be very low likelihood of NCs being used for live applications (as opposed to pilot schemes) by mid-1998. Exhibit V-1 shows responses by rating. Over two thirds of respondents rated the likelihood of using NCs for live applications at only 1 or 2 out of 5.

Despite this negative response, the NC market is changing extremely rapidly, due primarily to the NC-like features being built into PCs. INPUT expects the actual uptake of thin clients (not delineated by strict architectural definitions, and including NCs, Windows terminals, and NC-like PCs) to be higher than this Exhibit suggests.

Exhibit V-1

Likelihood of NC Use in Live Applications by Mid-1998
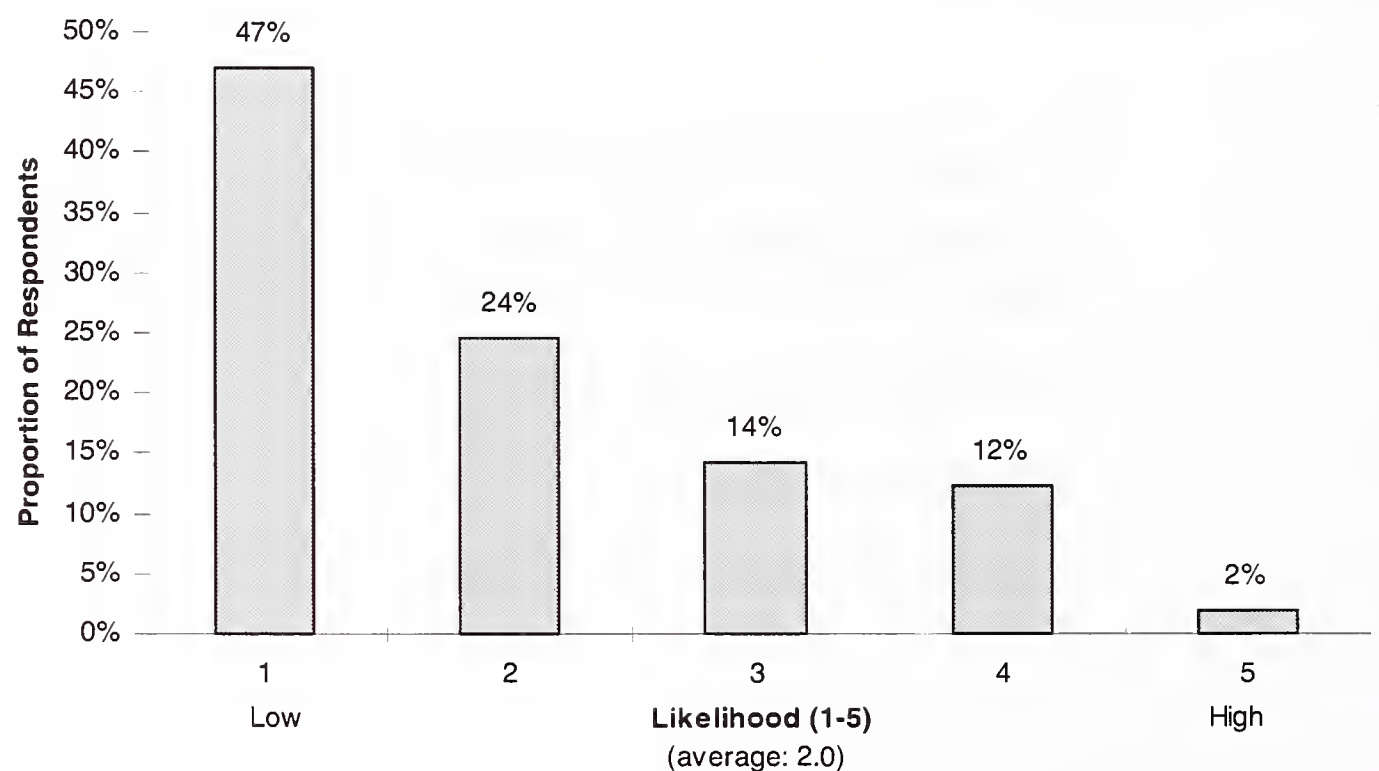
Sample: 49

Source: INPUT

1. Reasons for NC Deployment Decision by Mid-1998

Exhibit V-2 illustrates the reasons that respondents gave for not deploying NCs during the period mid-1997 to mid-1998.

Exhibit V-2

Reasons for Not Deploying NCs by Mid-1998

Sample: 25   Source: INPUT
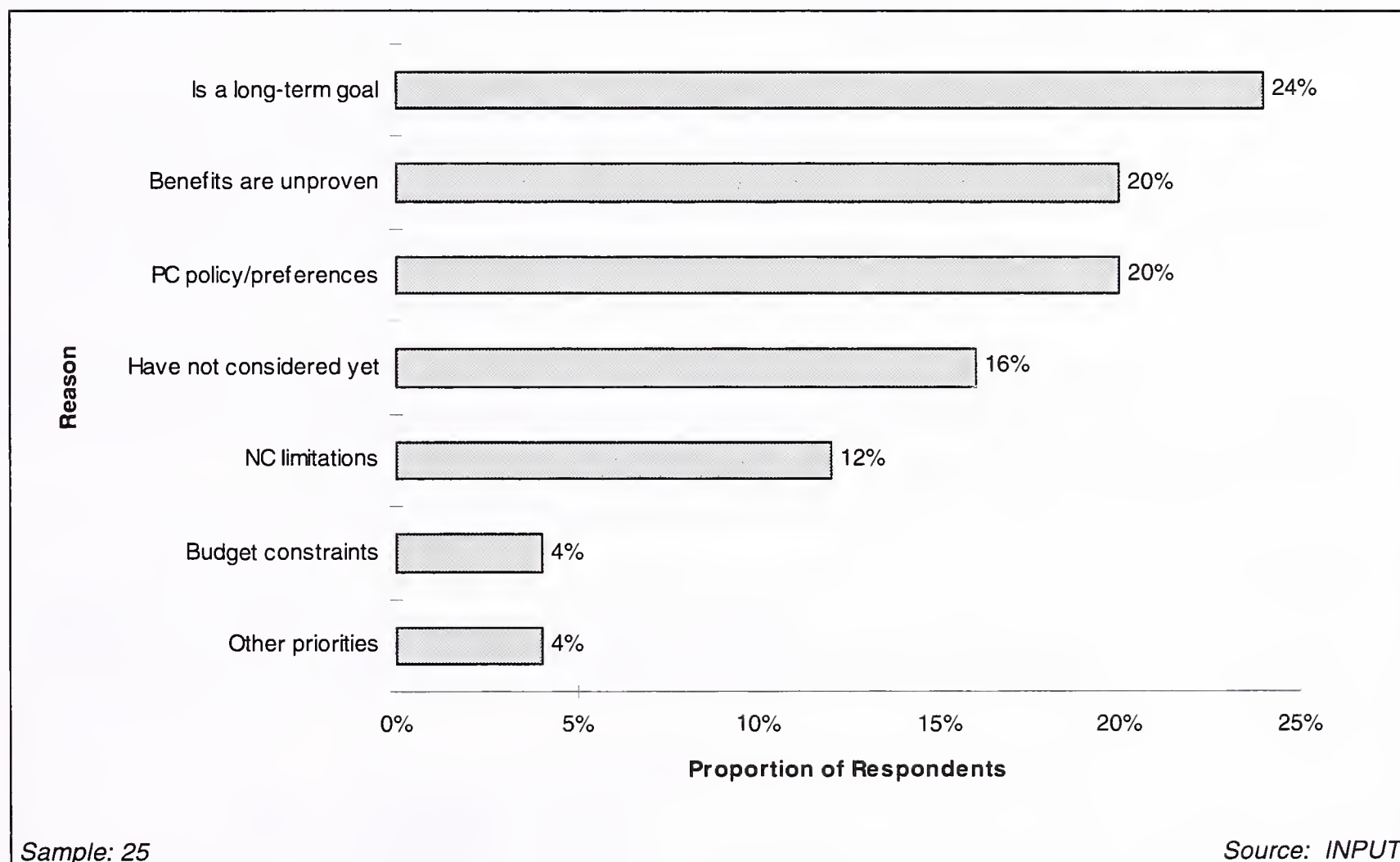
Seven respondents gave reasons for rating the likelihood of deploying NC by mid-1998 as medium or higher:

- Existing pilot scheme will turn into full implementation Parent company uses NCs, and they will spread to most divisions.

- Current pilot scheme looks successful which may lead to full implementation.

- Desire and need to implement a cost-effective thin client.

- NC deployment is inevitable.

- Java is already widely used in organisation.

- They can replace UNIX terminals with no loss of functionality.

B
Future Object Model Usage

Despite the low usage of enterprise-wide object models in mid-1997 (84% of respondents claimed not to have implemented a corporate-wide model), users clearly have high expectations of their adoption in the short term. Exhibit V-3 shows the expected use of the major architectures by mid-1999.

Both CORBA and COM use is expected to increase by around four times. A quarter of users, however, are delaying widespread object deployment until the shape of the NC and Java markets solidifies.

Exhibit V-3

Object Models Expected Mid-1999

OLE/COM 33%

CORBA 38%

None 6%

Depends on NC/Java 23%

Sample: 48   *Source: INPUT*
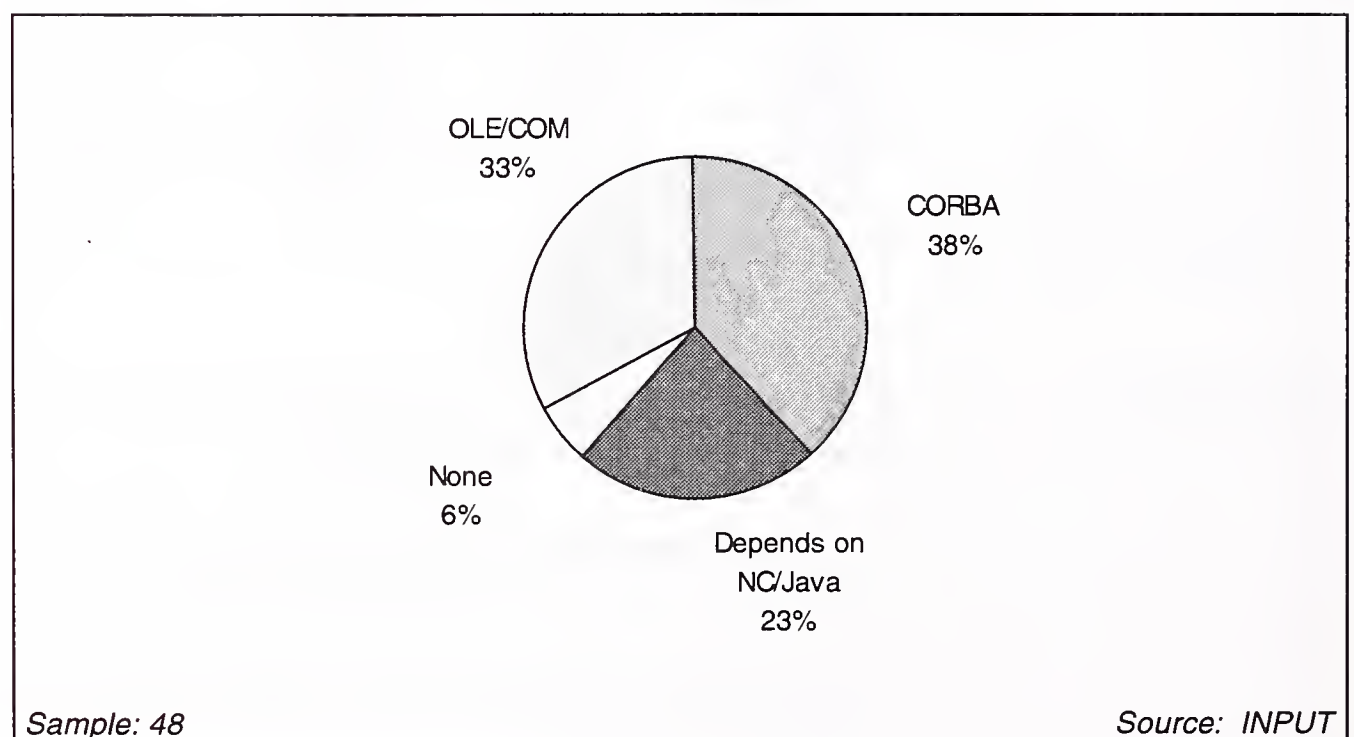
C
Influence of Intranet on NC Purchase Decisions

Respondents were asked how much more likely they would be to use NCs if they had an Intranet as opposed to a non-Intranet environment.

Overall, Intranets are not a great influence, averaging a rating of 2.4, although several users indicated they would be significantly more likely to adopt NCs if they had an Intranet in place.

INPUT expects the influence that Intranet ownership has on NC purchase decisions to decrease over time, due to the NC-like direction being taken by PCs. This expectation is despite the increasing development of Intranets. While the correlation of NC deployment with Intranet use will rise, this is due to the increase in use of both technologies, not the dependence of one on the other.

This statement is reinforced by respondents' views on the effect NC deployment would have on their IT. As shown in Exhibit V-5, the future scenario of accelerating Intranet use in an NC environment was given a likelihood rating of 2.3 out of 5. This is low, as is the finding just discussed.

Exhibit V-4

Influence of Intranet on Future NC Purchases
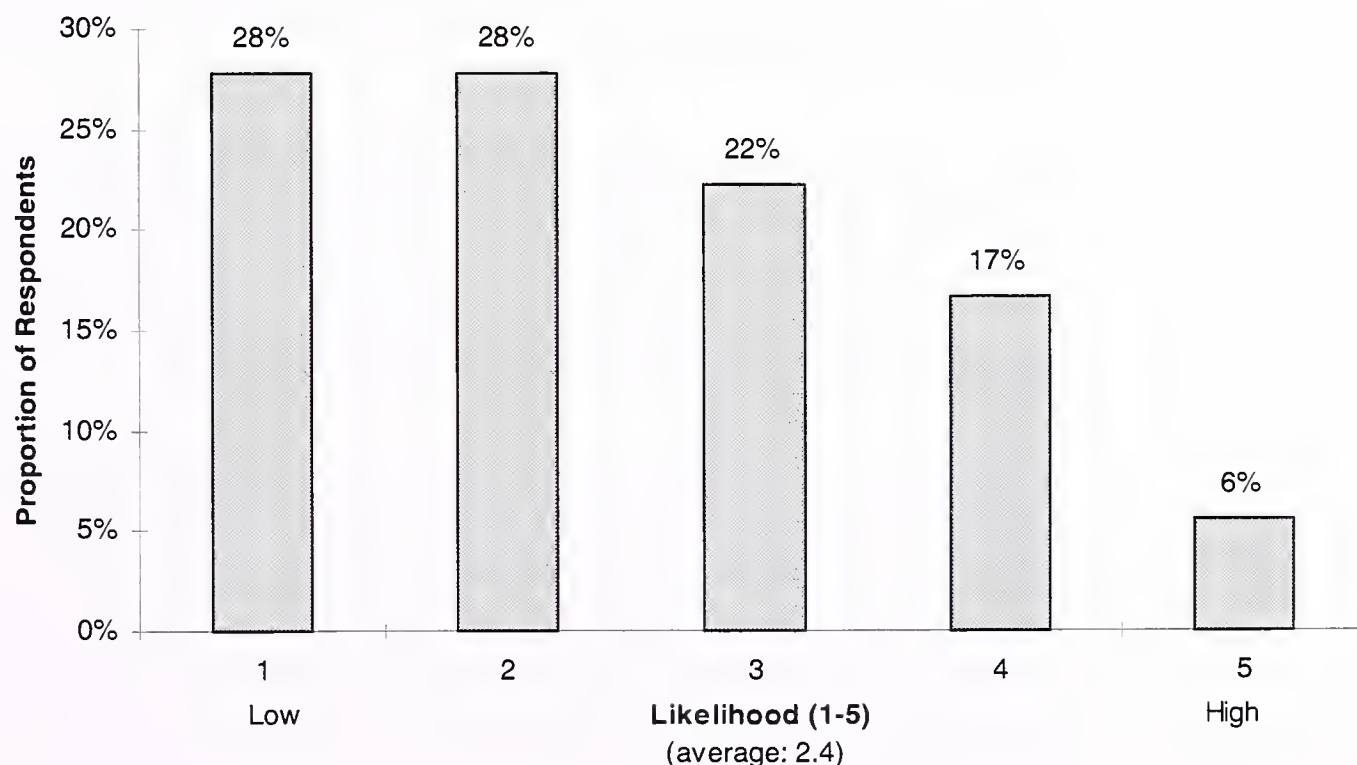
Sample: 18

Source: INPUT

D
Likelihood of Future NC Scenarios

Respondents were presented with five potential scenarios and asked to rate the expected likelihood of each occurring were NCs to be deployed within their organisation. The scenarios presented were:

- Development and use of Intranets would accelerate

- IT costs overall would increase due to the extra server and network resources required outweighing the lower initial cost of NCs

- You would source hardware and software from a more diverse mix of suppliers

- Use of proprietary platforms (e.g. Windows, AS/400) would decrease in favor of open platforms (e.g. UNIX, Java)

- Your IT environment and its support requirements would become more complex, not less

There is a low perceived likelihood of an increase in IT spending or a change in sourcing due to NCs. Although, in a theoretical Java-based IT environment, client platforms can be technologically diverse, in practice users are most likely to purchase NCs from one source, or through one channel such as an outsourcing contract, due to non-technological, business benefits such as single point of contact for support and service, and high-volume discounting.

Users regard the possibility of IT complexity increasing as a result of NC implementation as more likely. This is reflected by users' expectations of overall IT support cost changes, presented in Chapter VI—while end-users costs will decrease, network and server support costs typically will increase, partly as a result of increasing complexity.

Respondents were slightly more likely to expect that proprietary system usage will decrease in favor of open systems ("open" in this context meaning cross-platform technologies such as UNIX and Java, rather than only technologies controlled by formal standards bodies). All of the vendors controlling the platforms most under threat from this scenario are Internet- and Intranet-enabling their platforms in response, notably Microsoft Windows, Novell Netware, and IBM AS/400.

Exhibit V-5

Perceived Likelihood of Future NC Scenarios

Open beats proprietary — 3.2

IT increases in complexity — 3.0

Intranets accelerate — 2.3

IT purchase sources diversify — 2.0

IT costs increase — 1.9

Scenario (y-axis)

Likelihood (1-5): 1 Low — 2 — 3 — 4 — 5 High

Sample: 49   *Source: INPUT*
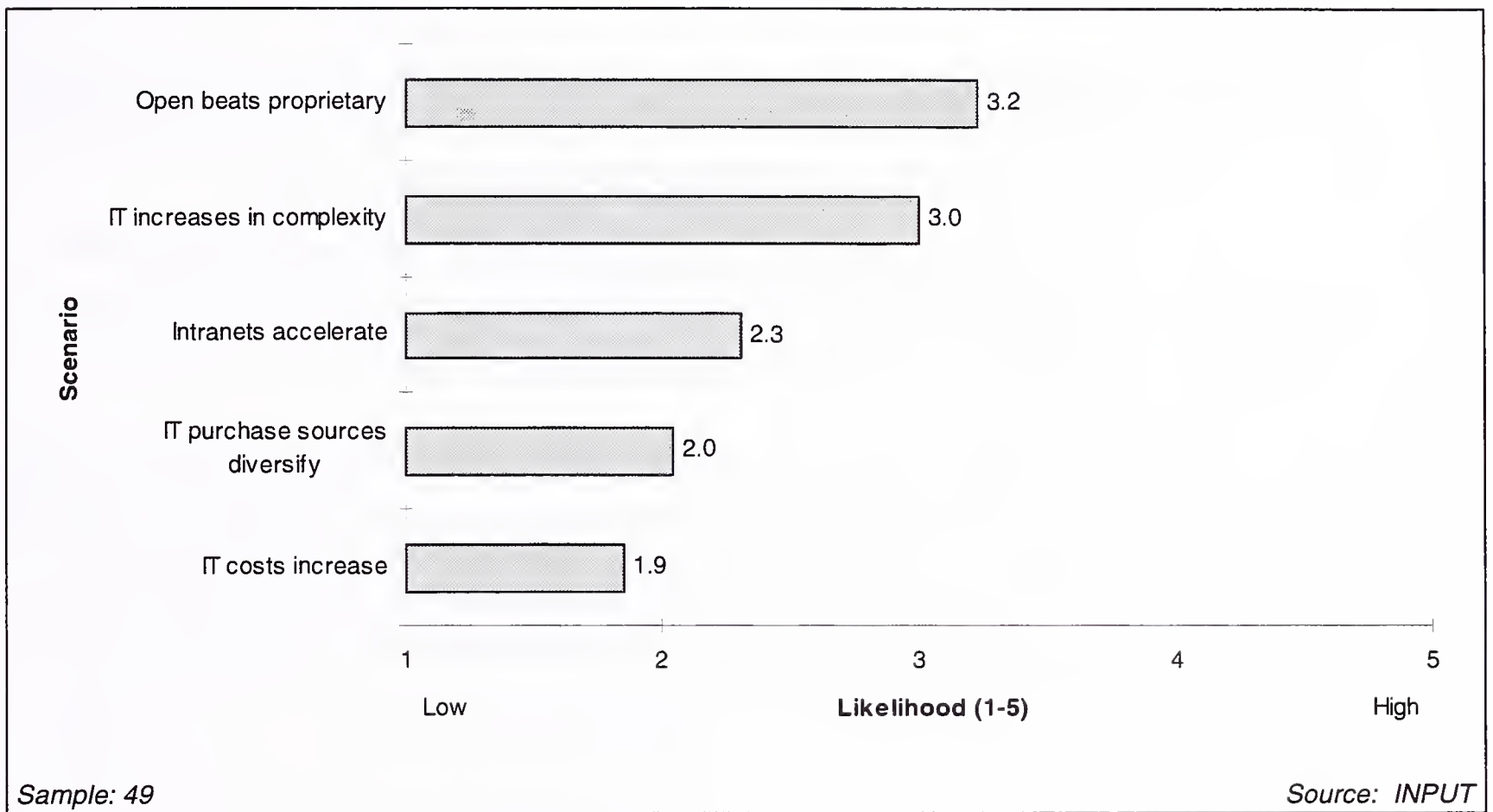
E

Future Important Server Characteristics

INPUT asked respondents to describe the technological characteristics which they believed would be most important to their organisation over the next two years (see Exhibit V-6).

IT managers expect to be able to operate a high-performance, stable, expandable server platform that is simple to connect to the corporate network/Intranet and the Internet, and that has in-built recovery facilities.

NC support was not stated explicitly by any respondent. However, seven out of 49 respondents rated the likelihood of their using NCs by mid-1998 as high or very high (4 or 5 out of 5 respectively), and another seven respondents rated the likelihood as medium (3 out of 5). This indicates that respondents do not consider server-based NC support as a prerequisite for using NCs.

Exhibit V-6

Server Characteristics of Most Importance By Mid-1999

EI37U

Proportion of Mentions
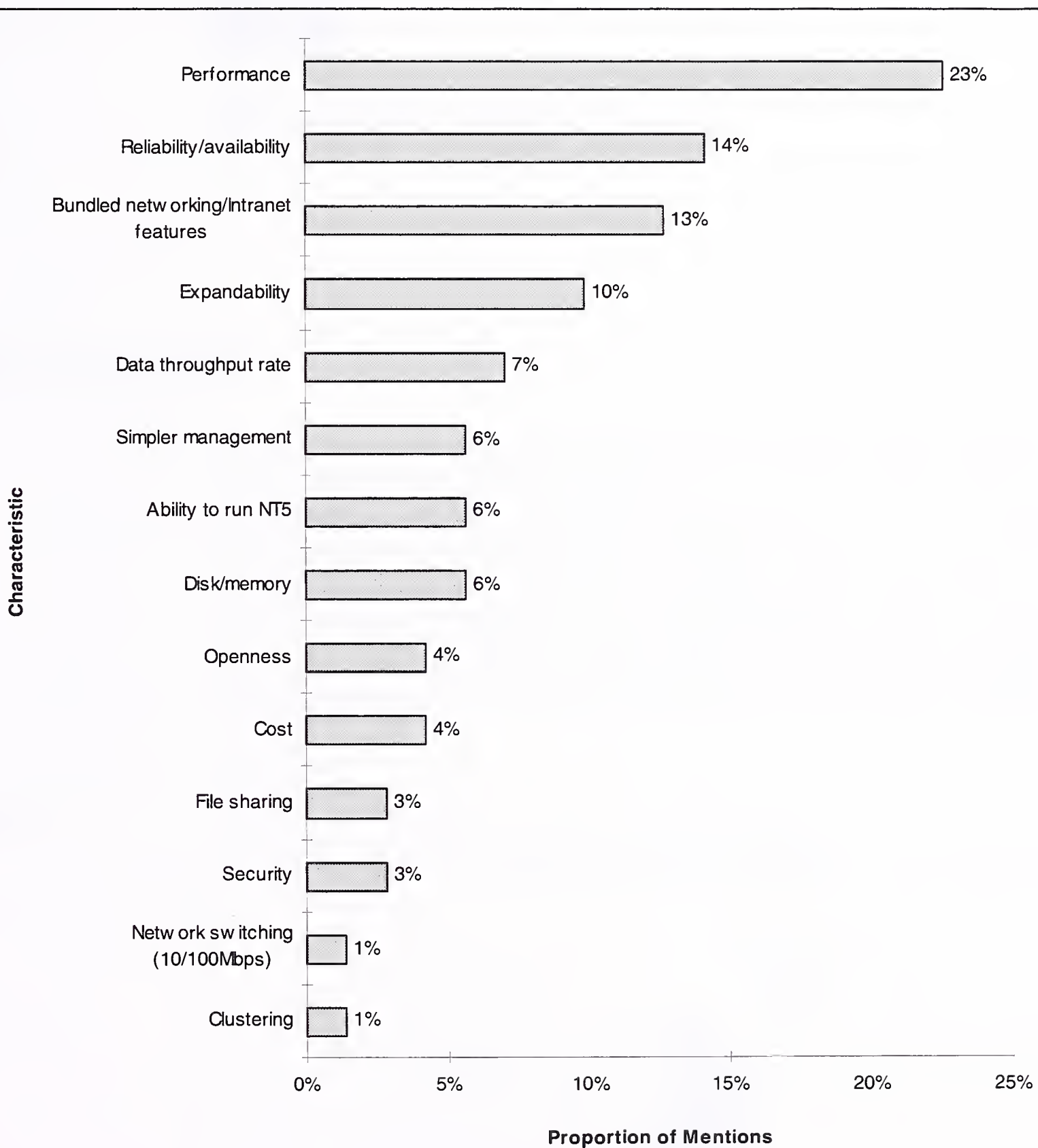
Sample: 71   *Source: INPUT*

(Blank Page)

VI
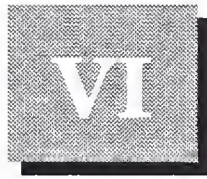
Budgets and Costs

A
Overall IT Budgets

Within IT budgets, the split between purchase costs, support costs and development costs is shown in Exhibit VI-1. NCs have the potential to lower purchase costs, although the decreasing price of PCs is making NCs less attractive in terms of capital investment savings. Where they are installed on a large scale throughout an organization (over 20% of a company's desktop platforms), NCs will affect support costs—end user support costs will decrease, but other aspects of IT support will require greater resources and spending, as discussed in the following sections.

Exhibit VI-1

Breakdown of IT Budgets

Sample: 30

Source: INPUT
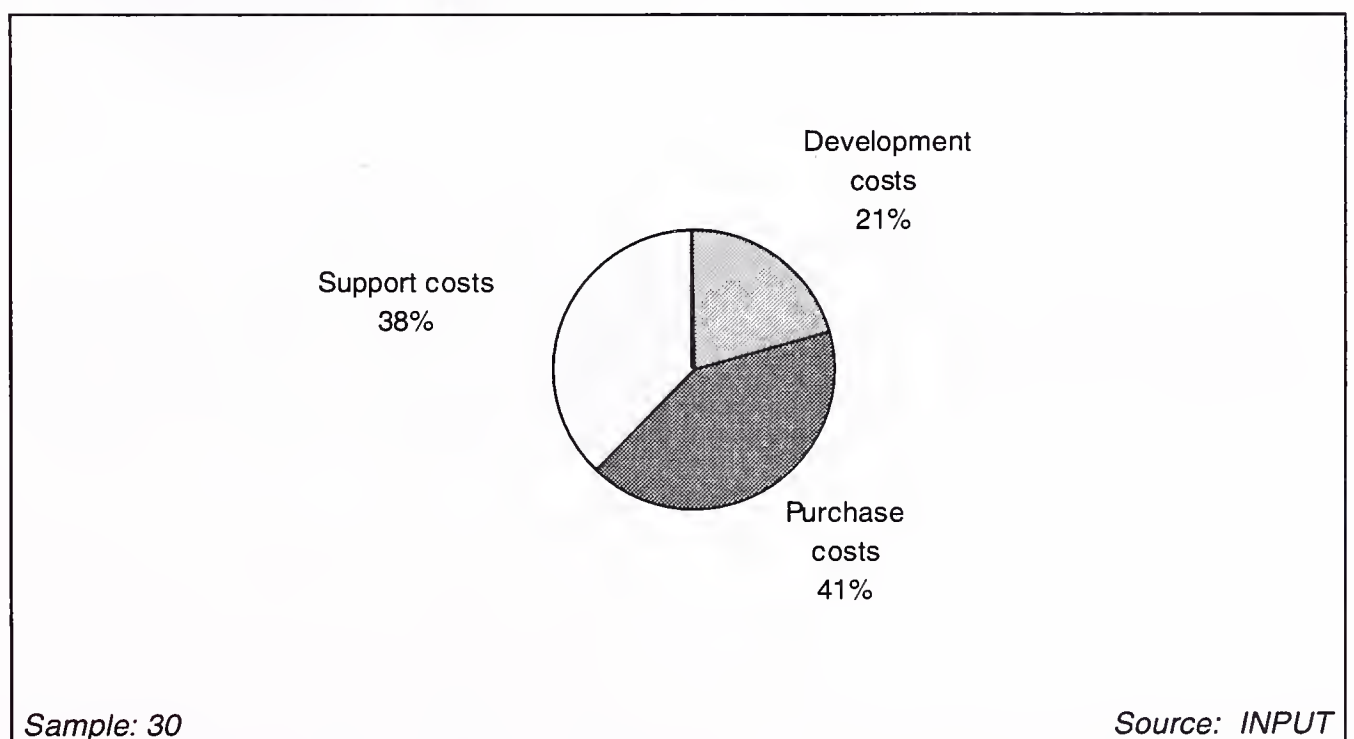
B
Effect of NC Deployment on IT Costs

1.   End-User Support Costs

NCs are commonly expected to reduce support costs, but the changes in support costs vary widely across the spectrum of IT, from desktop-level end-user support to server and network support.

Exhibit VI-2 shows the proportions of respondents who would expect end-user support costs to increase, decrease and stay the same where NCs are used. As might be expected, most users expect end-user support costs to decrease in NC environments.

Exhibit VI-2

Expected Net Effect on End User Support Costs With NCs

No change
28%

Increase
9%
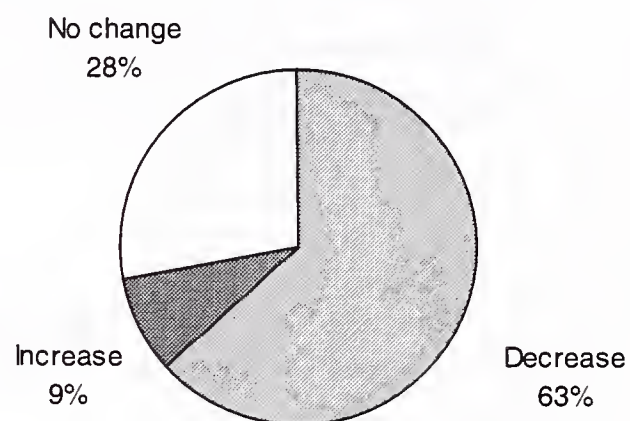
Decrease
63%

Sample: 32   *Source: INPUT*

Exhibit VI-3 shows details of the amount of change respondents would expect. The most commonly anticipated scenario is that end-user support costs would decrease by up to 40%, with a small number of respondents expecting even greater cost savings.

Exhibit VI-3

Expected Detailed Change in End User Support Costs With NCs
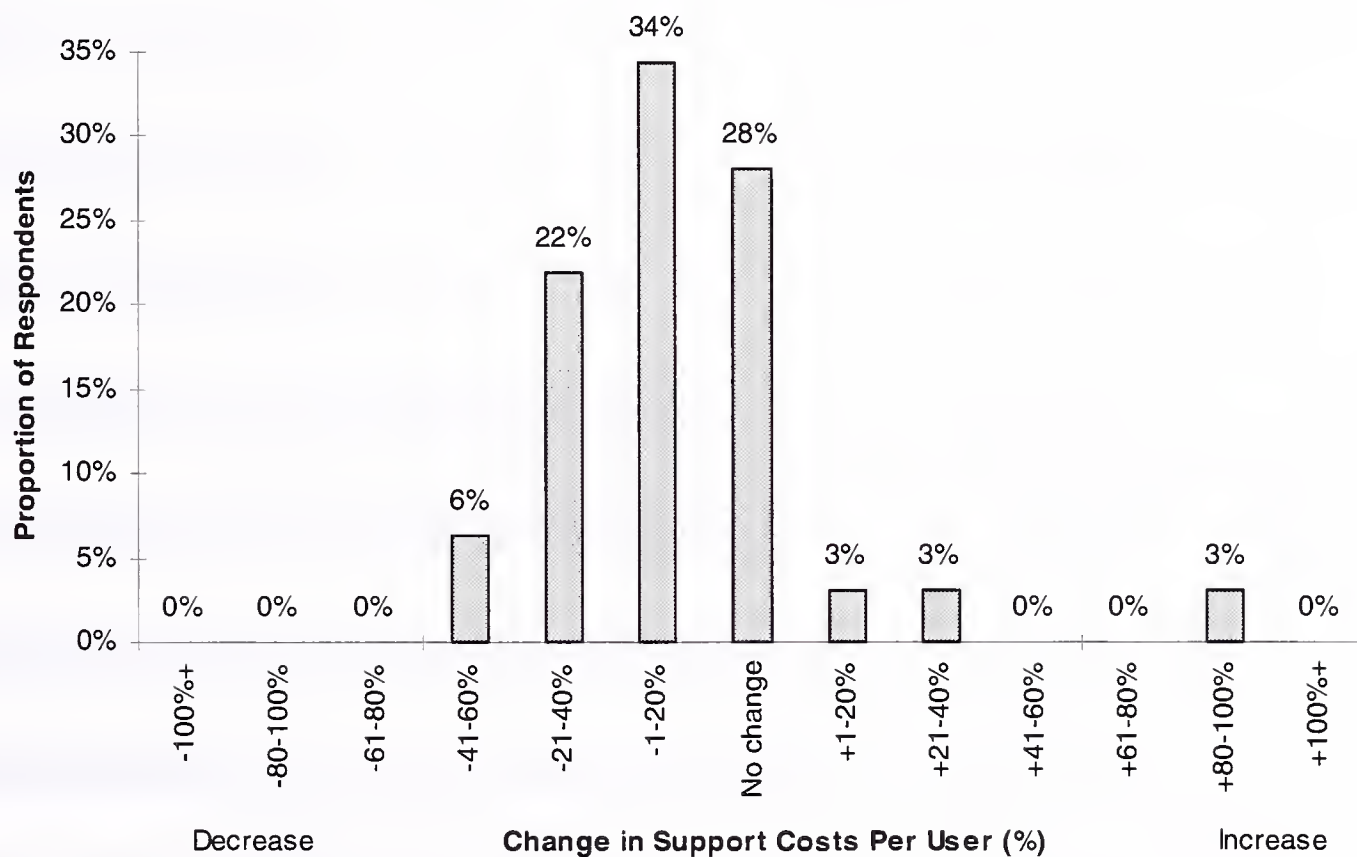
Sample: 32   Source: INPUT

2.   **Total IT Support Costs**

End-user support is the area in which NCs are most commonly expected to lower support costs. The picture is different for other areas of support. Exhibit VI-4 shows the expected change in support costs for all categories of IT from end-user to server and network support.

The Exhibit shows that support costs beyond the desktop are expected, overall, to stay the same or increase. The most notable example of this is in network and communications support: 55% of users expect NCs to increase such costs.

Exhibit VI-4

Expected Change in All Support Costs With NCs

Legend: □ Decrease ▢ No change ■ Increase

Category	Decrease	No change	Increase
Client application software support	59%	32%	9%
Client system software support	59%	32%	9%
Client hardware support	59%	32%	9%
In-house software development	18%	59%	23%
End user education and training	18%	59%	23%
Server hardware support	14%	59%	27%
Server application software support	9%	59%	32%
Server system software support	9%	45%	45%
Network/comms support	9%	36%	55%

Proportions of Respondents

Sample: 22   *Source: INPUT*

A

Buyer Questionnaire

A

Infrastructure

1. Characteristics

1. How many of the following clients does your organisation have

No. of users

a. Terminals (mainframe, mini or X)   _____

b. PCs or Apple Macs   _____

c. UNIX workstations   _____

d. Other (NAME) _____   _____

2. Currently, do you have an Intranet? If so, what proportion of your users have access to it?

Yes   [ ]

No   [ ]

Proportion of users   _____ %

3. What is the primary object model in your organisation?

a. CORBA   [ ]

b. OLE/COM/DCOM   [ ]

c. No object framework   [ ]

d. Other (NAME) _____ [ ]

4. How important are the following characteristics of an Intranet server
   platform (1=not important, 5=very important)? If you currently have an
   Intranet, how satisfied are you with each characteristic (1=not
   satisfied, 5=very satisfied)?

	Imp.	Sat.
a. Performance	____	____
b. Operating system security	____	____
c. Scalability	____	____
d. Availability	____	____
e. Purchase cost	____	____
f. Support cost	____	____
g. Ability to support NCs	____	____
h. Ability to serve Windows applications to non-Windows clients (eg using Citrix ICA)	____	____
i. OLE/COM/DCOM support	____	____
j. CORBA support	____	____
k. Server-side Java support	____	____
l. Centralised application/data management	____	____

5. How important to your organisation are the following characteristics of client platforms in general, and how satisfied are you with your PCs for each characteristic

         Sat.   Imp.

a. Performance   _____

     _____

b. Security   _____

     _____

c. Purchase cost   _____

     _____

d. Support cost   _____

     _____

e. Centralised system management   _____

     _____

f. Centralised application software/data management   _____

     _____

g. Terminal support (e.g. X and 3270)   _____

     _____

h. Mobile working capability   _____

     _____

i. Ease of connection/configuration to network   _____

     _____

j. Ease of use (for end user)   _____

     _____

2. Suitability

6. What are your organisation's primary servers? How suitable do you think they are to supporting NCs (1=not suitable, 5=very suitable)? Which do you think is most suitable for NCs, regardless of your usage (TICK ONLY ONE)?

Rotate list	Primaries	Suitability	Most suitable
a. IBM AS/400	[ ]	_____	[ ]
b. UNIX server	[ ]	_____	[ ]
c. Windows NT server	[ ]	_____	[ ]
d. Mainframe	[ ]	_____	[ ]
e. Netware server	[ ]	_____	[ ]
f. Other (NAME)	[ ]	_____	[ ]
_____	[ ]	_____	[ ]

7. What are your organisation's primary databases? How suitable do you think they are to supporting NCs (1=not suitable, 5=very suitable)? Which do you think is most suitable for NCs, regardless of your usage (TICK ONLY ONE)?

Rotate list	Primaries	Suitability	Most suitable
a. Oracle	[ ]	_____	[ ]
b. Informix	[ ]	_____	[ ]
c. Ingres	[ ]	_____	[ ]
d. Sybase	[ ]	_____	[ ]
e. db2	[ ]	_____	[ ]
f. Access	[ ]	_____	[ ]
g. Lotus Notes	[ ]	_____	[ ]
h. Other (NAME)	[ ]	_____	[ ]

_____   [ ]   _____   [ ]

8. What are your organisation's primary networks (LANs and enterprise networks, not WANs)? How suitable do you think they are to supporting NCs (1=not suitable, 5=very suitable)? Which do you think is most suitable for NCs, regardless of your usage (TICK ONLY ONE)?

Rotate list	Primaries	Suitability	Most suitable
a. 10Mbps Ethernet	[ ]	_____	[ ]
b. 100Mbps Ethernet	[ ]	_____	[ ]
c. ATM	[ ]	_____	[ ]
d. Token Ring	[ ]	_____	[ ]
e. Netware	[ ]	_____	[ ]
f. SNA	[ ]	_____	[ ]
g. Other (NAME)	[ ]	_____	[ ]
_____	[ ]	_____	[ ]

9. Which type of NC do you think would fit best into your IT environment (regardless of your intent to purchase NCs)? (TICK ONLY ONE)

a. Java terminal   [ ]

b. Hybrid general-purpose terminal   [ ]

c. Windows terminal   [ ]

d. Don't know   [ ]

Why?

_____

_____

10. How much more likely would you be to use NCs if you had an Intranet as opposed to a non-Intranet environment (1=no more likely, 5=much more likely)?

_____

11. How suitable do you consider Java as a programming language for corporate use currently (1=not suitable, 5=highly suitable)? How confident are you that it will be suitable two years from now (1=not confident, 5=very confident)?

a. Currently:　　　_____

b. In two years　　　_____

12. How suitable do you consider the Java Virtual Machine (JVM) as an platform for deploying and executing corporate applications currently (1=not suitable, 5=highly suitable)? How confident are you that it will be suitable two years from now (1=not confident, 5=very confident)?

a. Currently　　　_____

b. In two years　　　_____

13. What do you see as the strengths and weaknesses of PCs for corporate use?

_____

_____

14. What do you see as the strengths and weaknesses of NCs for corporate use?

_____

_____

3.   Future

15. What do you expect to be your primary object model in two years time?

a. CORBA   [ ]

b. OLE/COM/DCOM   [ ]

c. No object framework   [ ]

d. Depends on development of NCs/Java/Intranets   [ ]

e. Other (NAME) _____   [ ]

16. How likely do you think each of the following scenarios would be if you introduced NCs into your organisation (1=not at all likely, 5=very likely)

a. Development and use of Intranets would accelerate

    _____

b. IT costs overall would increase due to the extra server and network resources required outweighing the lower initial cost of NCs

    _____

c. You would source hardware and software from a more diverse mix of suppliers

    _____

d. Use of proprietary platforms (eg Windows, AS/400) would decrease in favour of open platforms (eg UNIX, Java)

    _____

e. Your IT environment and its support requirements would become more complex, not less

    _____

17. What technological characteristics of servers do you expect to be most important to your organisation over the next two years?

    _____

B

Support

18. How many full-time (or full-time equivalent) support personnel do you have in order to support all your IT users (eg, two half-time = one full-time)?

_____

19. Please estimate how much you spend on IT support per user per year

[currency] _____

20. If NCs were to be introduced into your organisation, by how much do you think your IT support cost per end user would change (in %)?

_____ %

21. How do you think widespread NC usage in your organisation would change costs in the following support areas (state as % of cost per user for each item. Eg: -10% = 10% saving on that cost per end user):

a. Client hardware support   +/- _____ %

b. Client system software support   +/- _____ %

c. Client application software support   +/- _____ %

d. Server hardware support   +/- _____ %

e. Server system software support (not database)+/- _____ %

f. Server application software support (e.g. database)   +/- _____ %

g. Network/comms support   +/- _____ %

h. End user education and training   +/- _____ %

i. In-house software development   +/- _____ %

C
Usage

22. What is the current state of NC use within your organisation? (TICK ONLY ONE)

a. Not using and not considering using or piloting NCs [ ]

b. Have considered and rejected using or piloting NCs [ ]

c. Currently considering using or piloting NCs   [ ]

d. Currently running an NC pilot   [ ]

e. Already using NCs for live applications   [ ] No of NC
    users _____

23. How many IT users are there in your organisation (in total)? How many of these do you think could be converted in theory to NCs due to the nature of their work?

a. IT users: _____

b. Could be NC users: _____

24. How likely is your organisation to use NCs for live applications (not just pilots) one year from now? (1=not likely, 5=very likely)

    _____

    What are the main reasons for this?

    _____

    _____

    _____

IF RESPONDENT STATED 3, 4 OR 5 — what department and application is most likely to use NCs?. E.g. call center, or sales database users

_____

25. How suited are the following departments to using NCs (1=not suited, 5=highly suited)?

a. Sales   ____

b. Marketing   ____

c. Customer service   ____

d. Call centre/help desk   ____

e. Product development / R&D   ____

f. Human resources   ____

g. Administration   ____

h. Corporate management   ____

i. Finance   ____

j. IS   ____

k. Logistics / distribution   ____

l. Other (NAME) _____   ____

26. How suitable do you think the following applications are to NCs (1=not suited, 5=highly suited)?

a. Collaboration (eg groupware, messaging, workflow)   ____

b. Office applications (eg wp, spreadsheet)   ____

c. ERP (e.g. SAP, Baan)   ____

d. Content creation / design (eg publishing, graphics)   ____

e. Financial (eg analysis, accounting, modelling)   _____

f. Scientific / engineering   _____

g. Other (NAME) _____   _____

h. Other (NAME) _____   _____

27. What is your typical annual IT budget for 1) purchase costs, 2) support costs, and 3) development costs. (TOTAL MUST ADD UP TO 100%)

1) Purchase costs   2) Support costs

1a. Client hw/sw   _____ %   2a. Client hw/sw   _____%

1c. Server hw/sw   _____ %   2c. Server hw/sw   _____%

1e. Networks/comms _____ %   2e. Networks/comms _____%

                    2f. End user training_____%

1f. Other   _____ %   2g. Other   _____%

(No need to name "other")   (No need to name "other")

3) Development costs

3a. In-house software development   _____ %

3b. Other   _____ %

    (No need to name "other")

28. How much is your total IT budget for the current year?

[currency] _____

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